An Exploratory Study of Using Participatory Design For Workplace Learning

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ABSTRACT

An Exploratory Study of Using Participatory Design for Workplace Learning

Research Problem. The purpose of this study was to explore using participatory design as an alternative to traditional instructional design for workplace learning.

Research questions. The study was guided by a main question and four ancillary ones. The main question asked if participatory design could be used within the context of a specific workplace to design instruction for workplace learning?

The four ancillary questions were:

1. How does practical implementation of participatory design differ from its theoretical presentation?
2. What practical challenges arise during the participatory design process that would need to be addressed in advanced planning?
3. What is the effectiveness of the resulting learning program in terms of achieving its intended learning objectives?
4. What type of change management issues arise for instructional designers who are experienced in traditional ISD methodologies?

Literature Review. The purpose of the literature review was to explore key principles and concepts of instructional design, identify some the limitations of

more traditional models of instructional design, define participatory design and explore how it may help address these problems. The researcher therefore reviewed the literature in four main areas: instructional design, workplace learning, participatory design and design research.

Methodology. This study involved exploring a particular instance of using participatory design for workplace learning in rich detail. Such studies are considered to be case studies reflecting a qualitative research methodology. The researcher therefore followed a team of six instructors working for a training institute of the Canadian Public Service who collaboratively determined what to design to meet their needs and how to design it. Over a period of one year, this core team worked together to design a course on instructional techniques to meet their specific needs. The researcher did not participate in the design effort but observed and documented the team's work instead.

Results and Discussion. The researcher found that participatory design can be used to design learning activities for workplace learning provided that some conditions are met and precautions taken. The results of this study suggest that participatory design for workplace learning is more effective when structured as a project and managed properly. The researcher therefore proposes a model of participatory design for workplace learning that clearly situates participatory design within a project management framework. Study results also suggest that organizations wishing to use participatory design should carefully consider their

context and how it may affect individual or team participation. Participants must be actively supported, by allowing them enough time to participate for example. Because some of those who were invited to participate in this study refuse to do so and because in some cases they subsequently worked against the project, the results of the study suggest that successfully using participatory design for workplace learning also means ensuring that all those involved understand the project, its requirements and expected outcomes, and actively support it. It would also be important to identify various other issues that affect the organization and addressing them directly in a way that minimizes their influence on the participatory design effort.

Keywords: design, instructional design, participatory design

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Completing a doctoral degree is mostly considered an individual process during which someone undertakes to perform and faithfully report on scholarly research. Unfortunately, that perspective doesn't account well or sufficiently acknowledge the invaluable support and help that is often needed to complete this work. I cannot claim to be an exception to this rule and can think of many people who were there with advice or encouragement when needed. You are all part of this work and I am deeply grateful for your support.

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Completing a degree is not work easily left behind at the end of the day. Instead, it inevitably intrudes into one's personal life and often burdens family and friends. You also deserve my gratitude. My wife and friend Barbara may perhaps understand better than anyone what it means to live with a 'PhD Candidate': you let me chase my dream and thus gave me an invaluable gift. Thank you.

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CHAPTER 1: BACKGROUND

I was first introduced to instructional design for workplace learning some thirty years ago. Through university studies and practical work, I learned about instructional systems design early in my career and was well drilled in the importance of applying related principles and concepts. My professors and instructors emphasized the importance of following the steps of Analysis, Design, Development, Implementation and Evaluation embodied in many models of instructional design and reflected in the generic ADDIE model. From the perspective of a newcomer, ISD models, and in particular their representation through ADDIE, offered the safety of a clearly defined series of steps, logically arranged and rationally defensible, that provided essential guidance and reassurance.

As I became more experienced, I felt less comfortable with this ISD model and with three issues in particular. First, ISD does not always adapt well to some of the realities of the workplace. I participated in numerous projects, for example, with little time for ISD so that related activities were truncated to only what was absolutely necessary to meet project requirements. Second, although ISD emphasizes a strong needs assessment, this step is in reality often omitted partly because of time issues and also because getting input from subject matter experts was often quite difficult. In one case, for example, getting access to subject matter

experts became so difficult that I had to rely on my own experience to define learning needs, research potential content and create learning materials. Third, I was concerned that I often designed learning materials with little or no input from learners. More than once, for example, input from learners was limited to gathering their comments and reactions to items in a survey, used as a form of needs assessment. As a result, I often felt that the materials I eventually prepared better reflected my – the designer's – perspective of what should be learned than what might be useful to learners.

I have since learned that others share my concern. For Gustafson (1995),

> "Rapid changes in world economic conditions are creating enormous pressures on business and industry to become more competitive and help their employees become more productive… Clearly, traditional ID with its requirement of extensive job and task analysis followed by objectives specification and analysis, followed by selection of instructional strategies and media, followed by development of the training, followed by its formative evaluation, followed by its implementation and summative evaluation, is not the solution."

Since first introduced a little more than half a century ago, instructional systems design models have guided the efforts of learning professionals to create courses and other learning activities both for education and for workplace learning. Although these models have since then gained wide recognition, many

of their users claim they do not always effectively guide and support the process of developing learning materials, especially for the workplace . Based on their review of the literature, Thomas and Xie (2005) summarize what is happening by explaining that "…the boxes and arrows in the ISD models only betray their complexity when they are put in real world practice." (Reiser, 2001; Gustafson and Branch, 1997; Dick, Carey and Carey, 2005; Stolovitch and Keeps, 1999; Gropper and Ross, 1987; Clark, 2008; University of Houston, 2008; Visscher-Voerman, Gustafson, 2004.)

This chapter therefore explores the challenges to instructional systems design in the workplace in particular and suggests one approach that might address these concerns. After reviewing concerns raised by the literature about ISD, it suggests a possible solution reflecting a different body of literature. The chapter closes by suggesting a research project that could assess the viability of this possible solution.

CONCERNS ABOUT ISD RAISED FROM THE LITERATURE

A review of the literature indicates that my three concerns about ISD are widely shared, along with several other concerns. With respect to my first concern, a study of how practitioners use instructional design in their projects found that they often skip steps either because some decisions were already made

before projects started that determined what should be done, for lack of time or because they considered these steps unnecessary (Tessmer and Wedman , 1992). They concluded that in practice instructional design is not regularly completed, occurring perhaps half the time. More recent research reports similar findings, indicating that practitioners often do not follow the steps of instructional design models or underlying theoretical assumptions, but rely instead on interaction with others to make instructional design decisions and learn about theories, trends and strategies (Christensen and Osguthorpe, 2004; Roytek, 2010). Further evidence shows that most instructional design practitioners have very little formal preparation, in many cases becoming instructional designers after being assigned that position (designers by assignment) (Kim *et al*, 2008). In such cases, instructional design models may seem foreign and unnecessarily complex, particularly when common sense seems to work just as well.

With respect to my second concern, Hanlis (2004) and Rickertt (2004) report that it is often difficult to access eventual learners and subject matter experts during the instructional design process, or else get subject matter experts to make firm decisions and commit to them. Other problems involving subject matter experts include disagreements between them that the instructional designer must settle, hostility towards the designer from feeling that since s/he is not an expert, s/he cannot possibly design the training well, becoming frustrated with not being able to talk with busy subject matter experts or having to work with

individuals who in fact are not true subject matter experts at all (Rossett, 2003). Using an established instructional design model does not prevent these problems from occurring.

With respect to my third concern, because instructional designers are often more closely involved in designing learning solutions than anyone else associated with this learning, they are often the ones that gain the most from the experience. Jonassen *et al*. (1993), for example, report a case in which instructional designers learned more by designing Computer-assisted Instruction than the target audience ever did by using the learning materials that were produced. If the purpose of instructional design is to create optimal learning conditions for selected learners, then situations where the instructional designer benefits more from preparing instruction than students do receiving it are not acceptable.

These research findings suggest there is a broad gap between the prescriptions inherent in existing instructional design models and what occurs in reality. Today's workplace presents complex problems that cannot be easily understood and addressed by following these prescriptions even though current models remain the essential blueprint for action taught to novices and loosely followed by more experienced practitioners. Models that simplify reality and offer clearer direction do play an important role by providing novice practitioners with essential tools to take their first steps forward (Carr-Chellman, 2006). Novices, however, do not always have the opportunity to gain the experience needed to

handle more complex projects. Some organizations, for example, consider training a temporary assignment, perpetually carried out by novices, subject to rapid turnover and efficiencies that make it difficult for novices to gain essential experience (Gayeski, 1991). More recently, Verstegen *et al* (2008) found similar problems with novices and that "they are not inclined to use a systematic approach for the design of instructional products."

Even for professionally trained instructional designers, current instructional design paradigms and models reflect a previous era of work that must be updated to reflect new organizational and individual needs (Davies, 1995; Becker, 2007; Häkkinen, 2002). Those arguing that instructional design models are fine when handled by competent, well-trained staff with the time needed to do the work also acknowledge that this is not often the case (Dick, 1995; Christensen and Osguthorpe, 2004).

Acknowledging the complexities of the modern workplace and the potential shortcomings of existing instructional design models is not enough to address these shortcomings. There is a need for a different approach that better reflects the realities of the workplace and of instructional designers, and some believe it is time to re-assess the current foundations of instructional design and shift from a mechanistic conceptual framework to one that explores the construction of human knowledge (Mashadi, 1998; Cafolla and Schoon, 2003). More research is needed to improve existing instructional design models, to better

adapt them to the modern workplace and to ensure they reflect on cognitive strategies more than behavioral ones (Clark, 2002). Instructional designers must move away from rigid, linear models and adopt others that allow addressing different design issues simultaneously to better accept the dynamic relationship between elements of the design problem (Ritchie and Earnest, 1999; Axmann and Greyling, 2003).

SOME SUGGESTED SOLUTIONS

New versions of instructional design models have been proposed to address some of the problems identified above. Wedman and Tessmer (1991), for example, propose the 'layers of necessity' model to increase the efficiency of instructional design and better deal with the time and resource constraints that often prevent instructional designers from completing projects using existing instructional design models and methodologies. This model is described as a "series of instructional design models, one nested within the other… Based upon the time and resources available to the developer, the designer determines a layer of design and development activities for a project, depending on the necessities of a project".

ID_2 represents an even more ambitious project to develop a second generation approach to instructional design based on more current learning and

instructional design theory. The term ID_2 is used to differentiate it from the first generation of instructional design models (ID_1) that include more common or generic instructional design models like ADDIE. Merrill, Li and Jones (1991) identify nine limitations of ID_1 to be addressed with ID_2:

1. Content analysis that does not deal well with complex and dynamic phenomena.
2. Limited prescriptions for knowledge acquisition.
3. Limited prescriptions for course organization.
4. Reflect theories that are essentially closed systems.
5. Failure to integrate the phases of instructional design.
6. Teaches pieces but not integrated wholes.
7. Leads to instruction that is more passive than interactive.
8. Leads to presentations that must be constructed from small components.
9. Is labor intensive.

It appears, however, that research to develop ID_2 and create the ID Expert system, led by David Merrill at Utah State University in the 1990's, has stopped. As of January 2011, the ID_2 web site is no longer up to date and no additional information or examples of the system and its use can be found. There is also no evidence that the ID_2 expert system to support the instructional design process is available and in use.

Participatory design could offer a more practical and viable alternative to tackle day-to-day instructional design problems in the workplace. This type of design consists of an iterative process during which designers and those for whom the design is intended work together to co-create solutions: participatory designers act as facilitators attempting to empower users in making their own decisions (Spinuzzi, 2005).

Introduced in Scandinavia in the 1970's to increase worker power and influence on the design and implementation of computer systems, it has since been used successfully in other fields, such as in technical communication, in nursing and architecture, as well as to improve designing human learning systems. It often draws on ethnographic methods to develop an understanding of important issues and how they can be addressed (Stanford University web site, 2007; Bodker *et al*, 1993; Bodker, 1996; Spinuzzi, 2005; Williams and Traynor, 1994; Carr—Chellman, 2006; Konings *et al*, 2005; Kensing, 1998; Blomberg *et al*, 1993).

As a form of instructional design, participatory design means more than consulting those for whom the training is intended at the start of the instructional design process during a needs assessment, or relying on subject matter experts to provide essential input. It means involving the intended learners in all steps of the instructional design process, working through design problems with them and deciding together what should be learned and how. It offers the opportunity to

integrate the experience of participants in the design of learning interventions to better situate them in a relevant work context and focus learning on more pertinent problem solving. Table 1 illustrates how participatory design could address some of the shortcomings of ISD.

Table 1: How Participatory Design Addresses ISD Shortcomings

Shortcomings of ISD	How Participatory Design Addresses this Shortcoming
Practitioners often don't follow the steps of the instructional design process as prescribed.	Participatory design is less about following the steps of a process and more about achieving results through an iterative process of exploration, action, reflexion and adaptation based on ongoing dialogue and collaboration (Spinuzzi, 2005).
It is often difficult to access and work with subject matter experts.	Participatory design reduces dependence on subject matter experts by getting input directly from learners throughout the instructional design process (CPSR, 2005). Participatory design, however, does not eliminate the need for subject matter expertise which participants may possess or find from other sources as needed.
Instructional designers learn as much or more from their doing ISD than intended learners.	By involving learners throughout the design process, participatory design empowers them to co-create learning that matters to them (Muller, 1993). Learner input also helps develop more powerful learning environments (Könings *et al*, 2005)
Today's workplace presents complex problems that cannot be easily understood and addressed by following the prescriptions of existing ISD models, and that often require multi-disciplinary solutions.	Participatory design supports interdisciplinary collaboration that is useful to identify and find creative solutions to significant problems (Clemensen *et al*, 2007).

Shortcomings of ISD	How Participatory Design Addresses this Shortcoming
Traditional ISD models are based on theoretical foundations associated with behavioral psychology that don't consider or integrate more recent learning theories. Such is the case, for example, with models from Skinner, Mager, Gagne or Merrill (Ryder, 2012).	Participatory design reflects a constructivist paradigm that recognizes the importance of tacit knowledge and attempts to elicit it through dialogue and developing a common language (Spinuzzi, 2005).

RESEARCH QUESTION

Participatory design may therefore be a promising alternative to conventional instructional design for workplace learning, worth exploring through research. Such a research study would seek to answer this question: Within the context of a specific workplace, how could participatory design be used to design instruction for workplace learning?

Ancillary questions include:

5. How does practical implementation of participatory design differ from its theoretical presentation?
6. What practical challenges arise during the participatory design process that would need to be addressed in advanced planning?

7. What is the effectiveness of the resulting learning program in terms of achieving its intended learning objectives?
8. What type of change management issues arise for instructional designers who are experienced in traditional ISD methodologies?

SIGNIFICANCE OF THIS STUDY

This study aims to make three important contributions. First, it seeks to inform on how participatory design can help improve the instructional design process. Second, it explores how user input through participatory design helps better focus on real [situated] problems to design more meaningful and engaging interventions. Third, it extends our understanding of principles and practices of effective instructional design.

DEFINITION OF TERMS

This section defines some key terms used herein.

Design: Rowland (1993) defines design as "A disciplined inquiry engaged in for the purpose of creating some new thing of practical utility. It involves exploring an ill-defined situation, finding – as well as solving - a problem(s), and specifying ways to effect change. Design is carried out in numerous fields and

will vary depending on the designer and on the type of thing that is designed. Designing requires a balance of reason and intuition, an impetus to act, and an ability to reflect on actions taken. It is also carried out as a reflective conversation with the materials of the situation. As reflection-in-action, it is an intelligent activity in which knowing how and knowing what cannot be separated. Designing for instruction is a subset of design reflecting similar characteristics as those of design. When applied to instruction, design efforts are focused on finding means to attain given goals for learning and development (Reigeluth, 1999).

Design research: developed in the early 1990's, design research (also known as design experiments) was developed to address several issues central to the study of learning, including the need for a design science of education, the need for approaches to the study of learning phenomena in the real world rather than the laboratory, the need to go beyond narrow measures of learning and, the need to derive research findings from formative evaluation (Collins, Joseph, & Bielaczyc, 2004).

***Effective* design**: one that meets its intended objective. Goodwin (1998) argues that effective individuals, ideas and innovations are both capable of producing, and actually produce an intended or desired effect. Effective design therefore results from using a method or approach that has the necessary elements and structure to guide towards achieving desired results, and that can actually be used to achieve such results.

Instructional design: Dick (1995) defines instructional design as a process to determine what to teach and how to teach it. Smith and Ragan (1999) similarly define it as the systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources and evaluation. As a process, it helps ask the right questions, make the right decisions and produce a useful and useable product based on the characteristics of situations and circumstances (Piskurich, 2000). More recently, Reiser and Dempsey (2007) define instructional design as a systematic process that is employed to develop education and training programs in a consistent and reliable fashion (p.11), while the Applied Research Laboratory at Penn State University define it as the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction (U. of Michigan, 2008). The current Wikipedia entry for instructional design states it is the practice of creating instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and appealing (2012).

Instructional Systems Design (ISD): the terms instructional design and instructional systems design are often considered interchangeable (Instructional Design Resources and Community Collaboration , 2008). The term 'system', however, emphasizes that what matters is not only completing the steps of a process in a prescribed order (being systematic) but that the process is iterative

and that steps are interdependent rather than independent. Checkland (1999) defines system as a model of a whole entity which, when applied to human activity, is characterized by hierarchical structure (wholes are made of smaller parts that together form that whole), control (guiding and directing action towards achieving meaningful objectives), communication (the interchange of information between parts) and emergent properties (the characteristics of a whole emerge from the dynamic interaction between all parts). Effective instruction therefore results from a process that is not only systematic but also systemic and therefore undertaken to achieve worthwhile objectives, resulting from completing all relevant activities or steps, where the output of one step is also the input for other ones, and that the characteristics of what is designed emerge from what is found and done at each step.

Needs assessment: the systematic effort made to gather opinions and ideas from a variety of sources on performance problems or new systems and technologies (Rossett, 1987).

Participatory design: an approach initially developed to assess and develop technological and organizational systems that encourage the active participation of users in the design and decision-making process (Stanford University, 2007). Participatory design emphasizes user participation in workplace decisions so that users are fully empowered participants in the design process (Muller, 1993). It is about getting users more fully involved in design as a

collaborative process (Blomberg *et al*, 1993). In learning and instruction, learners become the 'system users' so that participative design implies involving those who should eventually benefit from what is designed in planning instructional interventions, selecting and/or preparing instructional materials, activities, information resources and evaluation methods.

User-centered design: research and design done on behalf of those who are expected to use it. This can be contrasted with participatory design which involves users in the design process instead of designing on their behalf (Spinuzzi, 2005).

Work-based learning: this term is often used interchangeably with workplace learning. Rose *et al* (2001) explain that work-based learning was introduced to meet the needs of workers wanting to pursue their development but whose responsibilities did not allow attending a university program. Instead, they complete learning activities from which they and their employer are expected to benefit. Supervision of the work done and of the learning progression is available from academic and workplace mentors, but students are expected to be largely autonomous. Rose *et al* further propose two ways in which workplace learning differs from work-based learning: first, workplace learning involves a number of students from an organization working together as a group, although outside the university; and second, by allowing workplace learning programs to be customized to reflect the host company's expertise. These views on work-based

and workplace learning, however, are not accepted generally. In this research, the term workplace learning is used instead of work-based learning, to represent the various ways in which individuals learn at work.

Workplace learning: there is no clear and consistent definition of workplace learning (Menmuir and Thomson, 2006). Some definitions try capturing the concept in a single statement, defining workplace learning, for example, as any training directly related to the requirements of the job and offered in an organization (Glass, Higgins and McGregor, 2002). Other definitions attempt recognizing that workplace learning is more complex and multifaceted, includes both formal and informal learning and therefore the acquisition of all knowledge and skills passed on from one employee to another during the workday (Canadian Council on Learning, 2007). Workplace learning can therefore be defined as all of the means used by working individuals and organizations to learn the knowledge and skills considered essential to effectively perform job tasks or prepare for new roles and responsibilities.

CHAPTER 2: LITERATURE REVIEW

This study is rooted in four ongoing discussions in the literature: instructional design, workplace learning, design research and participatory design. This chapter reviews each of these discussions and explains how they inform this study.

INSTRUCTIONAL DESIGN

This section expands on the definition of instructional design presented in the previous chapter. It reviews how existing models are applied and closes by identifying concerns about the limits of these models for workplace learning.

Definition of Instructional Design

The *International Encyclopedia of Education* (1994) defines instructional design as the complete process of analyzing what is to be taught and learned; determining how it is taught and learned; conducting tryout and revision; and, assessing whether learners learn.

But the *Encyclopedia* also notes much inconsistency in terminology in this area (1994). Several examples of these inconsistencies can be found. A first one is the use of terms like instructional design in education. This is evidenced, for

example, by the variety of web sites using terms like instructional design and Instructional Systems Design (ISD) interchangeably, including one site on training and education that uses the term ISD for instructional design while stating it is also called Systems Approach to Training (SAT) or ADDIE (Clark, 2008 (b)). When discussing their use of terms such as instructional design and instructional systems design, Dick, Carey and Carey (2005) state "Note that the term instructional design is an umbrella term that includes all the phases of the [Instructional Systems Design] process… When we use the term instructional design, we will be referring to the entire ISD process."

This review of the literature further confirmed that terms are used inconsistently and that definitions vary. Instructional design is sometimes defined as the process of specifying conditions for learning, as determining what to teach and how to teach it, or else as a systematic method to plan, develop, evaluate and manage the instructional process to ensure competent student performance. (Seels and Richey, 1994; Dick, 1995; Kemp, Morrison, Ross (1998).

Other definitions are more detailed, underline the concept of systems and how ISD has roots in General Systems Theory (Briggs, Gustafson and Tillman, 1991; Gustafson, 1995). ISD is therefore seen as a process with six important characteristics:

1. It is systemic.
2. Planning implies an analysis of how elements interact.

3. The design process follows an orderly but flexible sequence.
4. Design procedures are research based.
5. Instructional design requires empirical testing and improvement of the overall plan.
6. Comparing results with original objectives.

Gustafson (1995) considers General Systems Theory the dominant paradigm of instructional design.

The importance of this paradigm is further evidenced in definitions highlighting the steps or elements of the instructional design process. Gustafson and Branch (2002) consider that instructional design is a system of procedures that is complex, creative, active and iterative, for developing education and training programs in a consistent and reliable fashion. Reiser (2002) sees instructional design as a field that encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources to improve learning and performance in a variety of settings. Berger and Kam (1996) view instructional design from four perspectives: process, discipline, science and reality. Process refers to the systematic development of instructional specifications using learning and instructional theory to ensure the quality of instruction. Discipline means the branch of knowledge concerned with research and theory about instructional strategies and how to develop and implement them.

The perspective of science focuses on the detailed specifications for developing, implementing, evaluating, and maintaining situations that facilitate learning of large and small units of subject matter at all levels of complexity (this is also the perspective adopted by Richey (1986) in her definition of instructional design). Reality highlights the importance of maintaining a more authentic view of the process that recognizes that instructional design can start at any point in the design process.

Instructional design is typically presented as a deterministic, essentially rational and logical process, or set of procedures to be followed (Rowland, 1993; Nilakanta, 2006). Rowland (1993) argues, however, that this view is incomplete and in some ways misleading: instructional design is not only a rational process of optimization but also one that is creative, based on intuition, involving divergent and convergent processes and carried out as a dialogue. More recently, he has proposed that chaos theory has much to inform ISD and Human Performance Technology (Rowland, 2007).

While this review of the literature did not find any single and generally accepted definition of instructional design, it suggests that instructional design is generally viewed as a process that is both systematic and systemic, and involving a set of rationally defined and organized steps derived from conceptual or theoretical perspectives. Rowland's point, however, that instructional design is often more creative than rational, reflects well my own experience.

The Application of Instructional Design

Instructional design is typically applied through various models that are often quite similar and that closely reflect what could be considered an ideal model. This section first describes this ideal model before identifying some of its inherent problems, particularly from the more practical perspective of workplace learning.

The Prescriptive, or Ideal Model

While there are many instructional design models, most have been developed over the past four decades and include similar steps with different names. Models tend to be variations of the generic model known as ADDIE and no single model has been demonstrated superior to others (Thomas and Xie, 2005; Cafolla and Schoon, 2003; Gayeski, 1991). The steps of ADDIE are:

- **A**nalyze needs, goals, and tasks
- **D**esign the instruction based on the analyses
- **D**evelop the instruction
- **I**mplement the instruction
- **E**valuate the instruction in light of its implementation

The Dick and Carey Model, considered by many as the next best model, differs somewhat from ADDIE. First presented in 1968 by Walter Dick and Lou Carey and updated over time (now in its sixth edition), it “includes ten

interconnected boxes and a major line that shows feedback from the next-to-last box to the earlier boxes. The boxes represent sets of theories, procedures, and techniques employed by the instructional designer to design, develop, evaluate, and revise instruction" (Dick and Carey, 2005). The ten boxes or components are,

- Identify instructional goals
- Conduct instructional analysis
- Analyze learners and context
- Write performance objectives
- Develop assessment instruments
- Develop instructional strategy
- Develop and select instructional materials
- Design and conduct formative evaluation of instruction
- Revise instruction
- Design and conduct summative evaluation

This model has evolved over time and integrates changes reflecting the influence of performance technology, context analysis, multi-level evaluations and total quality management, while remaining essentially linear and sequential. But the changes are limited. Dick (1996) acknowledges that this model was primarily intended to guide new designers and that more experienced ones may not follow the model as presented. He nevertheless believes it will remain a useful guide in the coming years particularly for instructional designers in the

workplace. In their latest edition of their book on instructional design, Dick, Carey and Carey (2005) introduce their model by stating "While our model of instructional design will be referred to as a systems approach model, we must emphasize that there is no single systems approach model for designing instruction. A number of models bear the label systems approach and all of them share most of the same basic components."

While the number of steps and their titles may be different, the ADDIE and Dick and Carey models reflect very similar conceptual frameworks. Both are systematic processes used to identify performance gaps, create interventions to reduce or eliminate them, and evaluate results. They represent what is most often taught to new designers, what more experienced designers claim to use (although not always as intended) and therefore in many ways what workplace practitioners consider the ideal instructional design model.

Problems With Current ISD Models As Guides To Actual Practice

Problems with current ISD models as guides to actual practice can be viewed from a theoretical or conceptual perspective, and from a more practical one.

From a theoretical perspective, a review of the history of instructional design highlights its deep roots in engineering and behavioral psychology, often apparent in how it is applied in the workplace. Instructional design emerged from

efforts started during the Second World War to more systematically plan and organize instruction, and thus better prepare recruits for combat. After the war, it transitioned easily into a corporate environment heavily influenced by the lessons learned during the war and by a Taylorist view of work organization and task performance. As a product of its time, instructional design relied heavily on ways of thinking about problem solving derived from engineering and behavioral psychology, seeing learning as something predictable that could be achieved by stating expected outcomes and arranging conditions to gradually become able to achieve them. Instructional designers are then the engineers that identify outcomes and arrange necessary conditions. Instructional design models, however, generally have not kept pace with developments in learning theory and therefore do not incorporate the latest ideas about human learning. Existing models continue instead to follow the prescriptions of behavioral psychology (Molenda, 1997; Stolovich and Keeps, 1999; Januszewski and Molenda, 2007; Fusch, 1997; Harris, 2000; Reiser, 2001; Cafolla and Schoon, 2003; Gustafson and Branch, 1997; Gustafson, 1995).

Three other problems related to a theoretical perspective appear in the literature. First, traditional instructional design models that assume knowledge can be decomposed from a source, then transferred and re-assembled by learners cannot be relied upon to create effective conditions for learning (Jonassen, 1998). Second, there is a growing need to re-assess the foundations of instructional

design and shift from a mechanistic conceptual framework to one of exploring the construction of human knowledge (Mashadi, 1998). And third, there is a need to continue learning about design and instructional design, not so much because our present knowledge and skills are wrong but rather to continually develop and improve our paradigms, tools, models and delivery systems, and generally better deal with the pressures and complexities of a changing workplace (Gustafson, 1995). In other words, we must resist the temptation to be satisfied with what exists and simply accept limitations, and work instead on improving both how we think about instructional design problems and the tools we use to solve them.

From a more practical perspective, the process of developing training seems to have congealed to such an extent that instructional designers in many cases follow a rigid sequential process that all but ignores what people really need (Jordan, 1996). Relying on lengthy front end analysis and needs assessment to address this problem and better identify needs, however, is unacceptable in a world characterized by an increasingly rapid pace of change, particularly as it occurs in the workplace (Nickols, 2000).

In the case of information systems, designers tend to view methods as precise directions to be followed rather than guidelines to be adapted to situations. When a method cannot be applied as intended, designers often blame it, blame others for not following it, or feel they must apologize for adapting to circumstances instead of following the method. It takes a fair amount of

experience and self-confidence to distinguish between the method itself and its practical use (Thoresen (1993, P.271). Instructional designers that use current ISD models often fall into the same trap as software designers: tending to quite explicitly assign responsibilities and therefore expect users to supply needs and designers to supply solutions (Triantafyllakos *et al*, 2008).

Dick (1995) suggests that instructional design models must become more comprehensive, designers more involved in corporate and institutional problem solving, design time reduced, support tools developed and better training given to new designers. These recommendations, however, may not always be practical in the current work context. For example, making models more comprehensive seemingly contradicts the need to reduce design time. Design in the real world often involves solving ill-defined problems in situations where designers must work with incomplete information. Following a particular method therefore does not automatically guarantee finding the right solution. Research reported in the literature further confirms that practitioners treat problems as ill-defined, generate solutions early in the design process while working out details only after developing a greater understanding of the problem, consider a variety of possible problems and solutions, use heuristics to identify solutions, then make ad-hoc decisions on how to proceed depending on the situation (Rowland, 1993). Models therefore remain idealized views of relevant action for problem solving reflecting expert opinion more than practitioner experience.

A shortage of time, having clear goals reflecting actual learner needs and dealing with complex or ill-defined problems are therefore significant issues for instructional design in workplace learning. Before considering possible solutions to these problems, the next section more fully explores what is workplace learning.

WORKPLACE LEARNING

This section identifies the key characteristics of workplace learning and their influence on the effectiveness of instructional design methods and models. It defines what workplace learning is, identifies the characteristics of effective workplace learning and considers more specifically how learners can participate in designing their own learning.

Definition

Numerous articles and other sources of information discuss workplace learning without clearly defining it. While some single statement definitions can be found, a number of authors argue that workplace learning is too multifaceted to be properly defined in a single statement. This section considers both points of view to more fully define workplace learning.

Definitions in Single Statements

Some definitions try capturing the concept of workplace learning in a single statement, as any training directly related to the requirements of the job and offered in an organization (Glass, Higgins and McGregor, 2002); or else as the recognition of learning achieved from work-related activities and experience, but only if there is evidence of learning (Roe-Shaw, 2006). It is also defined as a set of processes occurring in specific organizational contexts to acquire and assimilate knowledge, skills, values and feelings resulting in individuals and teams refocusing and changing their behavior. This definition includes both individual and organizational learning and highlights how learning at work is often complex (influenced by many different and/or rapidly changing conditions, situations and circumstances) and context-specific (what is learned and how it is learned often reflects or else is conditioned by the events, structure, values and individuals that form an organization) (Garavan *et al*, 2002).

When defined using a single statement, workplace learning is therefore typically seen as learning or training undertaken in the workplace, usually on the job, including on-the-job training under normal operational conditions, and on-site training conducted away from the work station (such as in a training room) (Australian Government, Department of Education, Science and Training, 2008). It is about gaining new skills and qualifications on the job, developing essential skills related to employability, and building a stronger competitive edge; it may

include on or off the job training and education that counts towards a qualification (New Zealand Government, 2008; Canadian Council on Learning, 2007).

Arguments Against Definitions in Single Statements

This review of the literature found a number of authors arguing that workplace learning is too multifaceted to be properly defined in a single statement. Definitions sometimes focus on learning in the workplace itself or are broader and include other kinds of work related learning (Menmuir and Thomson, 2006). While work and learning used to belong to separate categories, this is no longer the case. There is no single way of understanding learning at work, nor can there be given the diversity of work and differences between and within organizations (even though learning at and from work is increasingly necessary to continue working), and there is no universal model for learning at work (Boud and Garrick, 1999).

For the purpose of this project, workplace learning generally requires the interaction between individual learning processes, the workplace community and the enterprise as a technical-organizational system (Illeris, 2004). This interaction, however, can occur in multiple ways: formally or informally, individually or in groups, in the classroom or at work stations, using books and other learning materials, or mediated with computer technology.

Some see workplace learning as a learning system incorporating the needs of industry, organizations and individuals working in an organizational culture (Roe-Shaw, 2006). Workplace learning involves a dynamic relationship between employee learning processes, the workplace community and the organizational system. The learning environment provides the framework, but learning occurs from the interaction between employee and environment. It is also important to understand that workplace learning involves both the psychological process of individual learning and a social process (Illeris, 2004). Finally, there are case studies showing that workplace learning works: organizations gain competent, confident and valued staff; individuals benefit from personal and professional development; and clients get more competent service from staff (Menmuir and Thomson, 2006).

Definitions of workplace learning increasingly recognize the role and significance of informal learning there, although not always in clearly defined terms or with consistent practices. . The Centre for Education and Work, a Canadian non-profit organization that helps workplaces develop and deliver education and training solutions defines informal learning as

> *"*Learning resulting from daily life activities related to work, family, or leisure. It is not structured in terms of learning objectives, learning time or learning support and typically does not lead to certification. Informal

learning may be intentional but in most cases it is non-intentional, incidental or random."

Informal learning remains a relatively new field of interest with a body of research accumulated mostly over the past twenty years. Research suggests that up to 70% of learning at work in the United States may be informal while research in Canada suggests similar high rates of participation in informal learning. Although the actual rate of participation in informal learning at work may vary between places and over time, the growing trend to use social tools at work is expected to increase the role of informal learning at work even more (Wihak, 2011).

Research on informal learning, however, suggests that there is no general agreement about what is informal learning, how it may be different from other forms of learning at work or how to support it. Colley *et al (2003)*, for example, report in their research on informal learning in England that we can distinguish to some extent between formal (all that is planned and conducted to achieve specific outcomes) and informal or non-formal learning, it is practically impossible to distinguish between informal and non-formal learning (that may involve some organized endeavor or none at all) (Illeris, 2011). Although the results of this research are generally accepted, they are not considered conclusive and much remains to be done to clarify this concept and its use (Wihak, 2011).

This review of the literature further suggests that possible links between informal learning and participatory design have not yet been fully explored. Some authors argue that workplace learning is a social phenomenon more than an individual one and that focusing on individual informal learning is problematic because teams and team learning are more fundamental than individual learning (Wihak, 2011). Because participatory design involves team work and openly sharing information between participants with different backgrounds (experience and expertise), informal learning may well occur during participatory design although this must be confirmed. Because this research explores using participatory design as a design methodology for workplace learning, it does not focus specifically on informal learning and links to participatory design but will still consider how informal learning may occur in this case of using participatory design for workplace learning.

Limitations of Existing Definitions

Workplace learning, however, likely does not work exactly as described above and does not occur in reality as defined theoretically. Many organizations and workers have not embraced workplace learning and we cannot assume that knowing what workplace learning should be always leads to effective workplace learning when used (Spencer, 2002). Hager (2004) points out that Dewey, in 1916, was already aware that workers must see the social and political point of

their work and underlying ideas to gain from the educational potential of their work. Creating learning activities alone does not ensure that workplace learning will occur or that it will occur as intended. Given significant differences in the background and motivation of workplace learners, and differences in the conditions for workplace learning between organizations, firm formulas to develop qualifications likely only apply to limited groups. A more general solution is needed instead that applies to various groups and better accounts for variations in learner and organizational characteristics, needs, conditions or constraints, and potentially many other factors that influence workplace learning design and implementation (Illeris, 2003).

Any definition of workplace learning must also recognize that learning at work is conditioned by the characteristics of the modern business and what constitutes a normal day's work. The workplace has in many respects become the focal point for ongoing economic, organizational, technological and social change. The nature of work is evolving as a result of globalization, increased competition and a continuous stream of new technologies. Organizations worldwide must deal with market upheavals, important demographic movements, cultural intermingling and the unprecedented speed and complexity of business. These changes have resulted in profound transformations that impact people's experiences and expectations of work, of learning at work and of their expectations about what to expect from their employers in regards to workplace

learning (Leckie and Léonard, 2001; Roe-Shaw, 2006; Clark and Gottfredson, 2008).

The Importance of Experience in Workplace Learning

One important difference between workplace learning and other types of learning is that it essentially involves adults. Much of what we know about adult learning comes from work carried out in two related fields: educational psychology and its focus on understanding how learning happens; and, adult education per se (Merriam, 1993; Courtney and Luo, 1999). While adult learning has developed into a specialized field in education with a growing body of research and writing, the field is not "necessarily coherent in thematic focus or clear in defining the central concept of learning" (Pratt, 1993). The biggest claim we can make about adult learners is that they are different from children as learners and therefore require a different approach to instruction and instructional design (Courtney and Luo, 1999).

In what may be the most enduring contribution to adult education and learning, Malcolm Knowles presented five assumptions about adult learning amongst which the role of experience is considered central: "people attach more meaning to learning they gain from experience than those they acquire passively" (Knowles, 1983, p. 44). Experience can be defined simply as the interaction between individuals and their environment (Knowles, 1983, p. 56), or more fully

as the accumulation of knowledge or skill resulting from direct participation in events or activities. It is the content of direct observation or participation in an event (WordNet at Princeton University, 2006).

What we know about the role of experience in adult learning directly contributes to understanding workplace learning. Roe-Shaw (2006, p.8) states, "The fundamental concept of effective learning in the workplace covers a wide spectrum of learning activities, but is primarily based on learning through experience". What every employee gains from workplace learning through experience "depends on their motives and intentions, on what they know already and how they use their prior knowledge to effect conceptual change" (Biggs, 1999, p13).

Pratt (1993) summarizes the assumptions of adult learning into two principles that provide important guidance for designing workplace learning: first, knowledge is constructed by the learner instead of being passively received from the environment; and, second, learning involves interaction and interpretation of one's experiential world. In order to make workplace learning more relevant, adult learners must be involved in the process of setting their own directions and identifying the means to learn (Imel, 1994).

The Importance of Learner Participation

The previous discussion suggests that workplace learning is most effective when learners participate in its design. Supporting the right kind of learning at work requires an environment that treats workers as capable of competently determining, or participating in determining their own learning requirement (Jordan, 1996). Gains from workplace learning depend on job design and redesign reflecting organizational strategy, and are more likely when workers participate in the initial design process or in re-design (Spencer, 2002). Participation reflects a whole person view of learning (rather than being mind centric) and accepts the importance of social learning through groups, communities and organizations. Workplace learning is in effect a form of situated learning involving the construction of knowledge within social and cultural circumstances (Roe-Shaw, 2006).

Participation ensures greater interaction with training and development specialists to create learning opportunities better suited to improve individual, team and organizational performance. Case studies show that participation can be increased by helping people question the design process, contribute to innovate and develop more relevant learning activities and interact with others to further develop ideas (Menmuir and Thomson, 2006). Learning plans have also become a common way of identifying workplace learning opportunities and employee needs, and increasing individual and team participation to create such

opportunities (Roe-Shaw, 2006). It should be noted, however, that participation alone does not ensure achieving better results. For example, learner participation in instructional design may not alone overcome barriers caused by resistance to change in some organizations (Hager, 2004).

PARTICIPATORY DESIGN

Participatory design represents a viable alternative to address some of the issues identified with traditional instructional design by recognizing the importance of fully involving users in the design process and increasing learner and stakeholder participation in instructional design. This section therefore explores what participatory design is in terms of origins and key characteristics, how it is generally performed and its use in different fields.

Definition and Origins

As discussed in Chapter 1, participatory design is a process that deliberately seeks involving the users of what is designed in the process of collaboratively creating what best meets their needs. Its origins can be partly found in the work investigating the social construction of individual knowledge and partly found in the more practical research about involving working adults in collaboratively designing the tools they need to perform better.

Participatory design reflects a social-constructivist theoretical framework that emphasizes the construction of individual knowledge through social interaction. Two key concepts define this framework: first, it reflects the belief that individuals actively construct meaning and their understanding of the world by interacting with it. Each individual interprets the world around him in terms of his unique, personal background and experiences, and gradually develops their own views and understanding of the world in which they live and work. The second key concept is that of constructing knowledge through social interaction. The framework therefore acknowledges that knowledge is individually constructed but that constructing knowledge also involves social interaction and the negotiation of meaning (Strobel, 2006; Jonassen, 1998).

The socio-cultural aspect of learning has its own roots in the work of Vygotsky, Luria and Leont'ev who postulated that a human individual never reacts directly or through reflexes only to the environment. The relationship between the individual and the environment is mediated instead by cultural means, tools and signs. Individuals therefore learn through interacting with others, through using the tools and signs – like language – of their culture (Center for Activity Theory and Developmental Work Research, 2012).

Participatory design can therefore be seen as a process through which meaning – in terms of design decisions and actions – is developed through discussion and negotiation. Developing common tools and signs means acquiring

a common language, by defining terms or explaining design concepts for example. Participatory design is also fundamentally a social process based on discussion and negotiation: what matters is not only constructing individual meaning but also a common understanding of what constitutes effective action and problem solving.

The more practical roots of participatory design can be found in the work first done in Scandinavia in the early 1960's as a way of applying industrial democracy to introduce computer systems in the work place. Despite potential conflicts of interests, this democratic process brought together trade unions, employer associations and users to work together to design, develop and implement computer systems that not only performed certain tasks but also improved work conditions and labor processes. Using a more democratic approach to designing and developing computer systems reflected a fundamental concern in Scandinavia for fostering a society in which each individual might live in conditions conducive to personal development. This concern yielded a perceptible desire to make optimal use of material resources and devote great care to design in order to achieve a high degree of quality in the work carried out (CPSR, 2005 (b); Spinuzzi, 2005; Bodker, 1996).

The key issue in initial projects was building on people's own experiences and providing them with resources to be able to act on their current situation. Examples of early participatory design projects include one in Denmark to

increase trade union influence over the introduction of technology, or the UTOPIA project in Sweden and Denmark that attempted to influence the development of graphic technology (Bodker *et al*, 1993; Carr-Chelmann, 2006; Clement and Van den Besselaar, 1993). These Scandinavian projects developed an action research approach emphasizing the active cooperation between researchers and those being researched, suggesting that researchers need to enter into an agreement with local and central unions, managers and workers to improve their situation. Researchers therefore act as consultants and trainers, cooperating with both management and labor and adopting a less interventionist role than played in other projects.

Participatory design was therefore initially conceived as an approach to assess, design and develop technological and organizational systems with the active participation of users in the design and decision-making process. It focused not only on improving information systems but also on empowering workers to co-determine what the system and resulting workplace should be. It emphasized user participation in workplace decisions to improve the quality, productivity and satisfaction with computer systems. Since participation was considered a process in which two or more parties influence each other in making plans, policies or decisions, participatory design was seen as a democratic rather than meritocratic approach to design (Stanford University, 2007; Muller, 1993; Mumford, 1993; Clement and Van den Besselaar, 1993).

Contrasting Participatory Design with User-Centered Design

Participatory design is similar to another design approach, User-Centered Design (UCD) . UCD is a design philosophy and a process in which the needs, wants, and limitations of end users of a product are given extensive attention at each stage of the design process. It therefore seeks involving users more directly in the design process to create what meets their wants and needs instead of forcing them to adapt to what is designed (Abras *et al*, 2004). According to Schneiderman (2011), UCD "tries to design the product to accommodate the user rather than requiring the user to change their behaviour to accommodate the product".

UCD is therefore a broad term to describe design processes influenced by users that includes a variety of methods, like participatory design. Although the important concept underlying all UCD methods remains involving users in the design process in one way or another, what this means specifically varies between methods. In some cases, for example, involvement means working closely with workers to gather their requirements or to test design usability without directly involving them in the process of transforming requirements into specified outcomes. In other cases, like with participatory design, it means involving users in all parts of a design process (Abras, et al, 2004; Gao *et al*, 2007). Based on their conversations with users of user-centered design, Gulliksen *et al*, report that,

> "What came to light during the workshop was that [UCD and participatory design] are two overlapping sets, with an uncertain amount of overlap.

> Some cases were presented in the workshop which were user-centered, but which had no true sense of user participation (in the design process), whilst other projects were discussed where the user participation was in no true sense user-centered."

Involving users in designing what they need is also not without challenges. In their discussions of doing UCD, Gulliksen *et al* note four 'problem areas" in particular to consider when using UCD:

- User participation. Using UCD successfully depends on involving users that are committed to completing all design activities. Users should be able to participate and make meaningful contributions (in the form of job expertise, for example). Users should be respectful of others and willing to work in groups.
- Project management and work. There is often a need for a facilitator in UCD work to create and maintain collaboration between different groups of participants. For example, to facilitate communication between users and information-communication technology specialists, or with management. The facilitator must also keep track of the work underway and know when to intervene to keep the work progressing well.
- Organization. Issues related to the organization include how to create a culture that supports user involvement in design, how to avoid

organizational politics while taking power relations into consideration, and how to manage user participation and expectations generally.

- Communication. These problems highlight the need to communicate regularly with stakeholders to develop a shared understanding of what to achieve and the role of UCD in achieving it. It emphasizes the need to communicate regularly during UCD, both formally and informally, to involve users and the rest of the organization.

These problems reflect what takes place during UCD but might also apply to participatory design given the many similarities that were noted between UCD and participatory design.

Because this study seeks to explore how involving users in all aspects of an instructional design process for workplace learning may affect both the design process and its outcomes, it uses participatory design as a more inclusive form of UCD requiring extensive user involvement. What distinguishes participatory design from other forms of UCD is therefore the degree of user involvement and this study seeks to involve users as much as possible in designing what they need to learn at work.

Participatory design therefore differs from other design methods by attempting to give workers better tools to do their jobs while assuming they can best determine how to improve their work lives. User perceptions are considered at least as important as those of specialists, while computers and applications are

considered within the workplace context rather than separate from it (Spinuzzi, 2005; Schuler and Namioka, 1993). Like UCD, participatory design allows for an evolving design process that more fully explores the various design possibilities and scenarios, something that is often difficult when using a design process with more rigid, pre-defined steps (Hall and Bannon, 2005).

The association of Computer Professionals for Social Responsibility (CPSR) summarizes the above into five essential tenets, or principles, of participatory design:

- Respect users regardless of their status.
- Recognize that workers are a prime source of innovation and that design ideas arise in collaboration with participants.
- View systems as networks of people, practices, and technology embedded in particular organizational contexts.
- Understand the organization.
- Address problems existing in the workplace.
- Find real ways to improve the working lives of co-participants.
- Be conscious of one's own role in the participatory design processes (CPSR, 2005, (a)).

The goal of participatory design is therefore not only to check design with users but to base design on user input. Users, experts and designers equally share the responsibility for the quality of design and its implementation. Participatory

design attempts to examine the tacit, assumes it can be done through design partnerships and argues that design must be iterative (Bjerkes, 1993; Spinuzzi, 2005).

How Participatory Design Is Performed

Participatory design is typically not defined, and therefore performed, in terms of specific steps like those of the various ID models. It draws instead on different methods and techniques to iteratively construct an emerging design. Discussions about participatory design refer to stages or phases more than steps, and define them more broadly and inclusively than those of more traditional instructional design models. Phases, for example, are considered more open and adaptable to situations and circumstances than specific steps, and may use techniques like contextual awareness to stimulate user understanding of their work and how to improve design (Holtzblatt and Jones, 1993).

The literature on participatory design does not refer to any single, generic and generally accepted model of participatory design, like ADDIE in instructional design. Many researchers don't follow a model of participatory design with stages or steps, but focus instead on finding one or more techniques that may best stimulate and facilitate collaboration and co-design in a given situation. Johansson and Linde's (2005), for example, describe how games can be used to help participants explore a practice together from a design perspective. They consider

designing as entering into a dialogue with the design situation, and use a game to make the dialogue more interesting and creative. The ambiguous nature of a problem for which design is undertaken nourishes the dialogue between different actors playing together to achieve valuable outcomes. Within such contexts, forcing design to follow established steps may be counter-productive, by focusing the dialogue too narrowly on what matters at each step. Discussions and negotiations allow creating a common language that helps acquire common understanding and meaning (p.8).

Bjerknes (1993) proposes following what may be considered basic principles rather than a specific model or method. His advice includes obtaining management support; clearly specifying how much time users should spend on the project; having a steering group to discuss conflicts; ensuring participants have access to the necessary tools and equipment; and, listening carefully to users (not forgetting them).

As indicated above, some authors consider participatory design as a form of research and therefore more than an activity intent on producing artifacts or other tangible results. Others see in participatory design a constructivist paradigm that recognizes the importance of tacit knowledge and attempts to illicit it through dialogue and developing a common language. In both cases, participatory design is thought to include three basic phases: initially exploring a work situation; using different techniques to explore and understand work organization and how it may

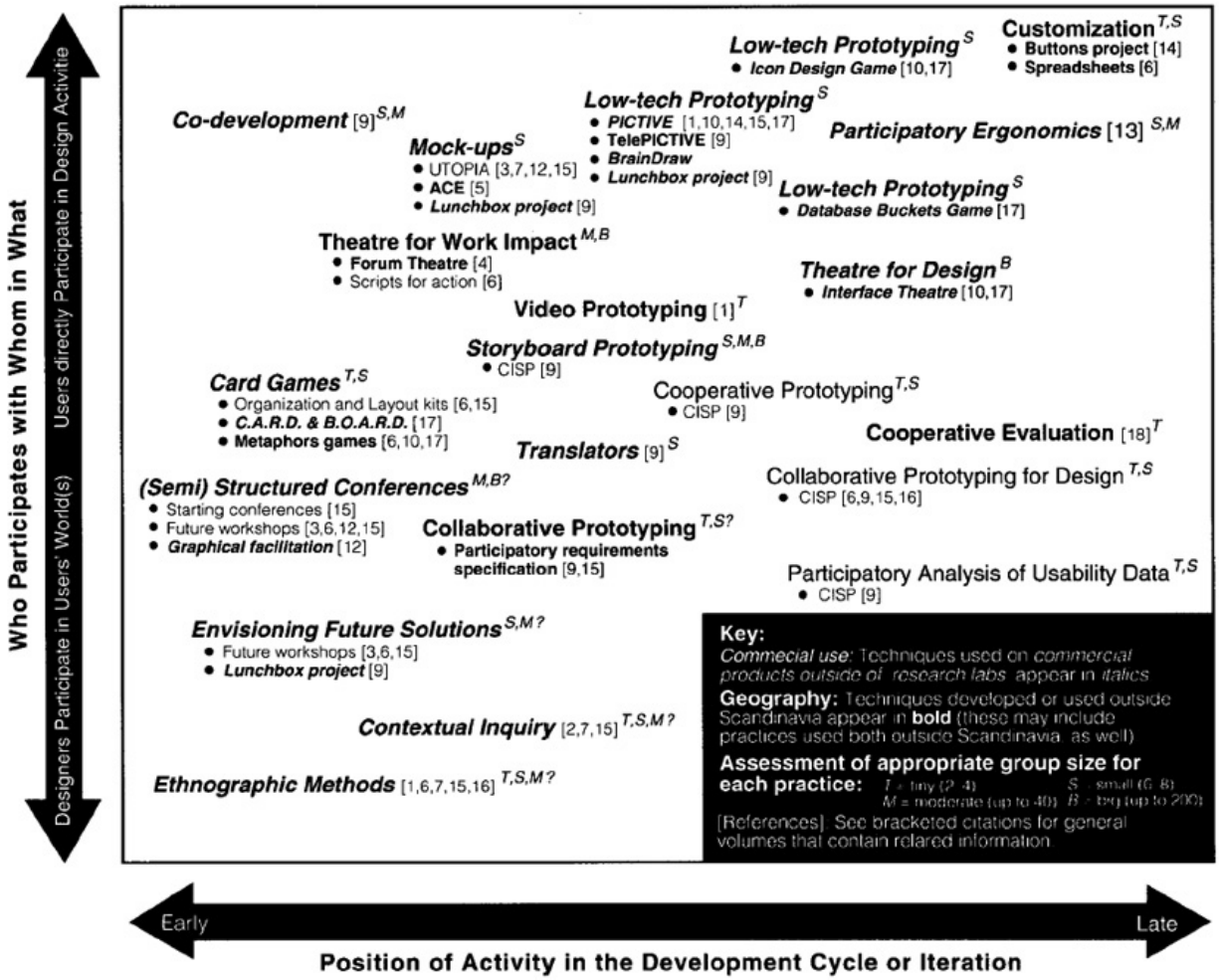
evolve; and, prototyping technological solutions to fit the work environment. Different techniques and other methods are used as needed to complete each phase. For example, observations and interviews can be used during phase 1, organizational games or role play during phase 2 and creating mock-ups or paper prototypes in phase 3 (Spinuzzi, 2005; McLaren, 2007).

In order to offer practitioners additional guidance to better match particular techniques for participatory design with the requirements of particular circumstances, Muller, Wildman and White (1993) present a taxonomy of participatory design techniques that take into account who is participating with whom to complete activities, the particular point in time in the design process or iteration cycle when techniques are used, and the size of the group that can be involved (ranging from small groups of a few participants to large ones of up to 200 participants). Their taxonomy, illustrated in Figure 1, includes more than a dozen techniques, ranging from structured or semi-structured conferences and courses to more innovative approaches such as card games or theatre.

Kensing, Simonsen and Bodker (1998) proposes a more clearly defined method for participatory design to "deal with the analysis of needs and opportunities and the preliminary design of functionality and form". This proposed method reflects first and foremost six principles emphasizing participation and co-development, effective communication and design sustainability. These principles are applied through a series of five main activities

constituting the design process: project establishment; strategic analysis; in depth-analysis of selected work domains; developing a vision for overall change and anchoring the vision. These activities, however, focus more on understanding the problem and less on solving it once identified.

Figure 1: Taxonomy of PD Techniques (Muller, Wildman and White (1993)



Boy (1997) designed the Group Elicitation Method (GEM) to deal with problems of "deriving an acceptable consensus from a group of experts who share neither the same background nor the same objectives" (p.28) and that have trouble understanding each other. GEM essentially consists of a one day session during which a facilitator works with a group of experts through a six phase process: formulate issue statement and select participants; generate viewpoints; reformulate viewpoints into concepts; generate relationships between concepts; derive a consensus; and, critically analyze results. These phases, however, suggest that GEM is primarily intended to help facilitate communication between experts rather than working through a design process.

This review of how participatory design is performed therefore suggests that while traditional instructional design tends to be more linear, participatory design is seen instead as highly iterative stages that use many different activities to help users complete a design process they define. Interviews, focus groups and courses, or even games and theatre are used cyclically to engage participants throughout the design process. Prototyping is also often referred to as a key participatory design tool to obtain and integrate better feedback into the design process. The common element linking these very different activities in participatory design is finding ways to engage people in thinking about a design problem, sharing ideas about possible solutions, trying options and eventually deciding how to solve the problem. Accordingly, applying principles to optimize

collaboration and co-design matters more in participatory design than following established steps like those commonly found in models of instructional design (Carr-Chellman, 2006; Clement and Van denBesselaar, 1993; Kensing and Munk-Madsen, 1993; Muller, 1993; Spinuzzi, 2005; Davis *et al*, 2008; Strobel, 2006; Triantafyllakos *et al*, 2008.)

The proposed principles, techniques and models of participatory design also tend to emphasize adopting a more systemic perspective of design problems and what may constitute viable solutions than traditional instructional design. An approach is regarded as systemic when it considers not only the elements of a problem but also their interaction and the emerging result, the system's environment, the conditions under which it exists and evolves, and the influence of various actors on it (Checkland, 1999). A systemic influence therefore affects the whole system and all its parts. Changes in the economy, in business or management processes or in hierarchical relationships for example, tend to affect all parts of a system and not only what is considered at the moment.

Traditional models of instructional design appear rooted in a more limited view of systems and systems thinking, reflecting constructs like input, process and output and referring to iterative processes as metaphors for being systemic. "While many understand ISD to be a systems approach..., this is primarily aimed at aligning the components of the system such as goals, strategies, materials, and assessment into a system that maintains internal consistency across stages" (Carr-

Chellman, 2006). Accordingly, although ISD is referred to as a 'systems approach', the use of the word system refers more to aligning the elements of a process for internal consistency than to a concern for gaining an understanding and appreciation of the broader context and conditions that may impact a design project .

Participatory design is therefore less concerned with following and maintaining internal consistency between specific steps, and more concerned with involving users in understanding how all system elements interact and influence each other regardless of the specific design task underway. The design team is continually encouraged to explore any aspect of the organization or workplace that may help them better understand a design problem and potential solutions.

Participatory Design in Different Fields: Results Achieved and Potential Problems

As stated earlier, participatory design was initially introduced, and is still used today, to develop and implement computer technology that best meets worker needs and improves their ability to perform well. Interest in using participatory design has also spread to other fields like the health sciences, public education in museums and education in schools. This section reviews examples of participatory design projects in fields other than computer science, in terms of processes followed, results achieved and types of problems encountered.

Participatory design was used in the health sciences to help improve the treatment at home of foot ulcers for people with diabetes, by using technology to link a community nurse with an expert at a local hospital (Clemenson *et al*, 2007). Although the initial project plan did not call for using phases, three such phases emerged as the project progressed: first, to establish a cohesive group of participants; second, to experimentally gain insight into possible solutions using prototypes; and third, to conduct a pilot test to try out selected solutions. The research team used interviews and focus groups to get input from staff, patients and relatives. Health professionals became very enthusiastic about being involved in a project in which they were able to influence both process and outcomes, but only gained this appreciation gradually: it was difficult at first to detach themselves sufficiently from existing operational conditions to think more creatively about problems and possible solutions. Patient participants were somewhat less enthusiastic since they felt the project affected health professionals and the health system more than it did their experience as patients. Involving a heterogeneous population in the project helped generate better input and increase project ownership but made it more difficult to reconcile different needs and interests. The researchers concluded with this advice on using participatory design in the health sciences: use a multidisciplinary team of researchers to achieve the right blend of expertise; get participants from the field studied; do not try anticipating the end result; dare to model being creative and playful; ensure

having access to a relaxed and undisturbed environment (for creative work); use prototypes to help participants see what they are trying to create.

Participatory design was also used to introduce staff at a museum to social media, as a way of engaging external communities in co-creating interpretations of the museum's content (Watkins, 2007). The project was structured into three phases: perform a due diligence; iteratively co-create content; and, measure outcomes. During phase one, researchers observed activities within the museum, reviewed the literature on best practices for participatory content creation and formulated an initial project strategy. In phase two, museum staff learned about using social media and iteratively co-created content using this media. Phase three involved evaluating outcomes and the participatory design process itself. The researchers concluded that design and production should not be considered one-shot affairs but rather an ongoing experience, believing that much of the project's success came from the dialogue between participants. They reported one possible project shortcoming: completing phase 1 on their own (without user input) may have caused them to become too directive when defining the problem and how to address it.

Participatory design was used in education to get students involved in co-designing a web-based environment for collaborative authoring of non-linear hypertext (Strobel, 2006). The purpose of the project was not to develop students' ability to use technology but rather to build their expertise in different content

domains. The author first created a hypertext system to support learning in a seminar class but found that students felt no ownership of the system and considered it limiting. The author reacted by inviting students to participate in designing a system that accommodated their needs. Over time, students built two more versions of the system that progressively included more of the functionality they wanted, while also working with content experts to develop the content. Students became much more engaged in the subject areas studied and developed a better understanding of how the technology they were using could best be applied to support learning. While still feeling they were primarily completing a class assignment, students nevertheless felt empowered to make a meaningful contribution. At the same time, the author identified three potential problems with using participatory design: first, students designed something that worked well for them but not necessarily as well for others, thus re-creating to some extent the problem that motivated the system re-design in the first place; second, communication between students and programmers was difficult since students had trouble understanding the constraints or other considerations professional designers must work with; and third, one group of students was very large so that not everyone was able to contribute equally.

Elsewhere in education, Figg and Burson (1999) used participatory design to enable student teachers to collaboratively design and develop a tutorial: as participants gained experience in the process they made greater demands on the

instructional design of the tutorial, created more sophisticated products and expressed greater satisfaction with the end result as well as with their experience as co-designers. Participatory design was also used to create educational software for 4th grade students. While that project focused on developing better software, students also improved their mapping skills and ability to work together as a team (Friedman, Drakes and Deek, 2002). More recently, participatory design was used to explore the nature and function of learner participation in instructional design for online learning in Equestrian Studies (McLaren 2007). That study sought to discover how learner participation could contribute to designing a powerful, virtual learning environment, but failed to truly integrate various user perspectives into the design process (the author designed the learning materials herself and had students validate her work rather than co-designing materials with them). Nilakanta (2006) explored the feasibility of using participatory design in higher education so Ph.D. students and faculty members could design and develop together an electronic portfolio system. Findings indicated five key factors characterizing the design process: 1) maintaining transparency of work processes; 2) continually invoking the design ethos; 3) maintaining a sense of community; 4) embedding design in user context; and 5) making design recursive. Finally, Taylor (2003) relied on participatory design to create training programs for developing countries in a variety of fields, like agriculture, health and nutrition, or education.

These examples illustrate how the driving theme in participatory design is not so much process and steps but rather working together in true partnerships to create solutions that matter to those who use them. This partnership is built on the foundational principle of recognizing the importance of dialogue to build understanding for action: as the experts of their own experience, users must learn to share it for others to understand what the design problem may involve and what constitutes effective problem solving. In traditional instructional design, the designer has both the power and authority to act and typically arrives ready to start, with an agenda of things to do and discuss. In participatory design, power and authority are shared so that questions are more open and leadership in a conversation changes and evolves to meet functional rather than hierarchical needs. An effective partnership must therefore maintain a conversation that encourages reflection and reinforces shared meaning. This makes participatory design a flexible approach best applied by focusing on its purpose rather than on its method.

DESIGN RESEARCH

Design research has been used for some time to address various design problems. This section reviews what design research is in terms of key

characteristics and experimental aspects, and possible links between design research and participatory design.

Numerous examples can be found of design research in *non*-educational settings: to provide elderly care at home; to help people with declining cognitive abilities stay independent; to improve customer service and make a work environment more ergonomic; to transform and make the experience of visiting a museum more personal; to create virtual worlds; or, to design a videogame to improve army recruitment (Laurel, 2003). Since design research is a broad field of inquiry that has been used in many areas, this review of the literature focuses on its application in education.

Definition and Origins

Design research was first introduced in the early 1990's as design experiments (O'Donnell, 2004; Collins *et al*, 2004). It was developed to address several issues central to the study of learning, including the need for a design science of education, to study learning in the real world, to go beyond narrow measures of learning, and to derive research from formative evaluation. More specifically,

> "Design research can be defined as a genre of research in which the iterative development of solutions to practical and complex educational problems also provides the context for empirical investigation which

> yields theoretical understanding that can inform the work of others (McKenney and Reeves, 2012)

Educational design researchers consider their work as a form of use-inspired research that integrates basic and applied scientific research. They are therefore equally concerned with developing theory and achieving practical improvements, and accept the need for theory to inform design and vice versa. Gaining a scientific understanding allows both framing the research and investigating solutions to real-life problems. This type of research can therefore help improve design decisions – for example, what to design and how best to design it – while also contributing to the professional development of instructional designers. Better linking theory and practice is especially important because much educational research is faulted with not properly contributing to either developing theory or applying it practically, or else is not used by practitioners at all. As summarized by McKenney and Reeves (2012), "the intention [of design research] is – alongside the development of theoretical understanding – to make a real change on the ground".

As an approach of progressive refinement, design research therefore involves creating a first version of design, putting it into the world to see how it works and then making constant revisions based on experience. The intent remains to both to refine practice and address theoretical questions (Collins *et al*, 2004).

Some consider design research as any kind of research that produces findings that are fed back into further cycles of innovative design (Bereiter, 2002). Design research is not defined by its methodology (many can be used) but rather by its purpose to sustain innovative development. It is part of the design process, is inherently interventionist and is characterized by emergent goals arising and evolving through cycles of design and research.

Barab and Squire (2004) consider design research not so much as a single approach but rather as a series of approaches to produce new theories, artifacts and practices that account for and potentially impact learning and teaching in a natural setting. It focuses on understanding the messiness of real-world practice and considers context as centrally important rather than as an extraneous variable.

While labels like design experiments, design-based research, design research, development(al) research, formative research and action research suggest a diversity of approaches, key ideas remain consistent throughout. Design research can be seen as a modified ADDIE, where evaluation is replaced with constant data gathering and where implementation is subject to ongoing refinement (Wang and Hannafin, 2003, 2005).

Key Characteristics and Experimental Aspects

Design research largely remains an emerging paradigm for studying learning in context through the systematic design and study of instructional strategies and tools At the same time, effective design research should reflect some key principles, like those proposed by the Design Based Research Collective (2003): :

1. Intertwining goals of designing learning environments and developing theory.
2. Development and research take place through iterative cycles of design, enactment, analysis and redesign.
3. Research on design must lead to sharable theories.
4. Research must account for how theory works in real settings.
5. Uses methods that connect research process and outcomes.

With respect to improving education, Collins *et al* (2004) consider that design research demonstrates two other critical characteristics: a focus on design and the assessment of critical design elements. They indicate that design research is characterized by its use of ethnography to carefully look at design in practice (including the interaction between social, contextual and cognitive variables) and identify seven aspects that contrast experiments and design research (Table 2, Contrasting Aspects of Experiment and Design Research).

Table 2: Contrasting Aspects of Experiments and Design Research

Experiments	Design Research
1. Controlled environment	1. Messy, real life situations
2. Single dependent variable	2. Multiple dependent variables
3. Controlling variables	3. Characterizing the situation
4. Fixed procedures	4. Flexible design revision
5. Social isolation	5. Social interaction
6. Testing hypotheses	6. Developing a profile
7. Experimenter led	7. Co-participant design and analysis

Controlled experiments attempt in particular to control variables that may affect outcomes while design research does this through using an iterative process (Winn, 2003). Controlling variables, however, is not always possible or appropriate when first exploring situations or events to better understand what they involve and how they affect people. O'Donnell (2004) suggests that instead of trying to control all variables, design researchers should try optimizing as much of the design as possible by carefully observing how it works out and making design changes as often as needed. Finally, new questions that arise during the design research process should be allowed to influence the research framework, provided that a meaningful relationship is maintained between the questions that are added, the initial framework and student learning.

Reeves *et al* (2005) identify the following characteristics of design research:

- A focus on broad-based, complex problems critical to higher education.
- The integration of known and hypothetical design principles with technological affordances to render plausible solutions to these complex problems.
- Rigorous and reflective inquiry to test and refine innovative learning environments as well as to reveal new design principles.
- Long-term engagement involving continual refinement of protocols and questions.
- Intensive collaboration among researchers and practitioners.
- A commitment to theory construction and explanation while solving real-world problems.
- Explore significant educational problems, rather than conduct research for its own sake.
- Define a pedagogical outcome and create learning environments that address it.
- Emphasize content and pedagogy rather than technology.
- Give special attention to supporting human interactions and nurturing learning communities.
- Modify the learning environments until the pedagogical outcome is reached.

- Reflect on the process to reveal design principles that can inform other instructors and researchers, and future development projects.

This discussion allows identifying important common points between design research and participatory design: in particular, a focus on real life situations, a commitment to iterative work, using ethnography as a research methodology and recognizing the importance of context. Participatory design, however, stresses the importance of getting users involved in all parts of the design process and is less concerned with developing theory than is design research. Other key differences also exist between design research and participatory design. Table 3, Design Research and Participatory Design, reviews some of these similarities and differences based on the characteristics of design research identified above.

Table 3: Similarities and Differences Between Design Research and PD

Design Research	Participatory Design
A focus on broad-based, complex problems critical to higher education.	Addressing problems at work that may be complex but not necessarily critical to higher education.
The integration of known and hypothetical design principles with technological affordances to render plausible solutions to these complex problems.	Not focused on integrating known and hypothetical design principles with technological affordances. May use technological affordances to resolve a problem.
Rigorous and reflective inquiry to test and refine innovative learning environments as well as to reveal new design principles.	Reflective inquiry is a key characteristic of participatory design and is considered fundamental to engaging users in a process

Design Research	Participatory Design
	of co-creating meaningful solutions.
Long-term engagement involving continual refinement of protocols and questions.	Participatory design does not anticipate or expect specific timelines or durations. PD projects may be shorter or longer as needed to address real and current problems.
Intensive collaboration among researchers and practitioners.	Intensive collaboration between designers and users, to co create what users need and want.
A commitment to theory construction and explanation while solving real-world problems.	Not focused on theory construction. Based instead on resolving practical work problems that are real and significant to those involved.
Explore significant educational problems, rather than conduct research for its own sake.	PD may be used to address problems that are not always educationally significant. PD may be used to address problems at work that may involve learning without being educational in nature.
Define a pedagogical outcome and create learning environments that address it.	Can be used to define a learning outcome and create learning environments that address it. In this study, PD was used to define a workplace learning outcome and create a course to address it.
Emphasize content and pedagogy rather than technology.	Participatory design emphasizes collaborative problem solving more than content, pedagogy or technology. The role and importance of content, pedagogy and the use of technology are defined by the users collaborating to design what they need.
Give special attention to supporting human interactions and nurturing learning communities.	Human interaction is fundamental to PD. Because PD is involves social interaction and because PD participants learn from each other, it can also be seen as nurturing learning communities.
Modify the learning environments until the pedagogical outcome is reached.	Because PD proposes addressing real-life problems occurring at work, design is typically subjected to time and other constraints that preclude continuing with design until all stakeholders are satisfied

Design Research	Participatory Design
	having reached the best pedagogical outcome.
Reflect on the process to reveal design principles that can inform other instructors and researchers, and future development projects.	Also an essential part of PD. All stakeholders involved in the design process (directly or indirectly) may learn from doing PD, share what they have learned with others and gradually influence how instructional design for workplace learning is perceived and carried out in an organization.

How Design Research Has Been Applied

Design research has been applied in educational and in non educational settings. In educational settings, Brown and Campione (1994) used design research to successively refine the design of a series of integrated learning activities to study subject areas in biology and ecology. They collected a wide variety of data about students and teachers including both standard outcome measures (reading, writing, content knowledge, computer competence) and information from various other sources (transcripts of student planning documents, student portfolios, electronic mail queries to peers and teachers, ethnographic observations of discussions, planning sessions, peer tutoring and other events, teacher observation and more). They used this variety of information to view the classroom and the activities taking place there from different perspectives leading to a deeper understanding of how their interventions

influenced how students approached the study of selected subject areas and results achieved.

Collins *et al* (2004) describe research by Diana Joseph who used design research to create learning activities that activate deep learner interests to achieve serious objectives. Design progressed in cycles where each cycle allowed identifying necessary changes. As applied in that project, design research made it possible to more effectively study issues of motivation in learning. Field notes and artifacts produced by students were used to uncover patterns of learner engagement. Artifacts were analyzed to see how students grappled with ideas while creating them. Findings were used to review the design and draw more general conclusions, such as the effects of the design on motivation.

Design research was also used in various other projects, such as to support the learning of interdisciplinary content, the learning of science concepts, the emergence of web-supported communities for teacher professional development and multi-user virtual environments to help children develop their sense of purpose (Barab, 2004). In one project, data gathered from observations, field notes, videotapes of learners and interviews (both semi-structured and formal) were used to investigate how participating in a science camp that used activities designed through design research got students involved in not only learning about science but in doing science (Barab and Hay, 2001).

Using Design Research for This Study

This study proposes following some of the principles of design research - like focusing on real life situations and committing to iterative work – but does not constitute design research. The main reasons for not doing design research is that the researcher will not directly participate in this study but will observe the participants instead. The researcher has chosen not to participate in the process in order to better explore how working professionals who are not familiar with participatory design may use it to achieve worthwhile results. The researcher will therefore not engage in design choices to better observe participants and have less influence on the environment.

HUMAN PERFORMANCE TECHNOLOGY

Human Performance Technology (HPT) is the field that focuses on improving the performance of those working in results oriented systems, like organizations. It therefore focuses on maximizing the achievements of people at work and implies applying what we know about human and organizational behavior to achieve valuable outcomes, economically and effectively. Although improving human performance may involve learning, HPT does not focus exclusively on designing or using learning effectively at work but seeks instead to

improve a system by identifying and addressing all relevant problems (Stolovitch and Keeps, 1999).

HPT is generally established on the principles of general systems theory and has deep roots into behavioral psychology. But HPT also relies on the practical experience of those working in the field to improve the theory and develop better tools or processes for human performance improvement.

HPT recognizes the importance of good instructional design but is not a model of instructional design per se. Instead, it is a way of structuring how we think about certain kinds of problems and their solutions. With respect to instructional design, major associations for workplace learning professionals (with deep roots in HPT) are increasingly relying on competency models instead of process models to describe what constitutes acceptable professional practice.

Over the past few years, The Canadian Society for Training and Development has developed a competency model that is becoming an important body of knowledge on the standards of practice for workplace learning and development professionals in Canada. In its list of competencies, CSTD clearly emphasizes the need for workplace learning professionals to identify performance needs, determine their cause and select solutions that directly address them. It is not clear, however, how closely these competencies reflect a model of instructional design or how they would change if participatory design was used instead of another model. This competency model also does not clearly identify

competencies for effective project management and properly planning and executing the tasks of a project.

The instructional design competencies published by the International Board of Standards for Training, Performance and Instruction also emphasize the importance of identifying performance needs, along with the need to consider the characteristics of the environment (physical, social and cultural aspects) during this analysis. The ibstpi competencies include a section on implementation and management that highlights the importance of properly planning and managing instructional design projects. Ibstpi also recognizes in this section the need to "promote collaboration, partnerships and relationships among the participants in a design project" (ibstpi, 2000). This model therefore more specifically recognizes that managing projects and working effectively with others are fundamental for success in instructional design. The importance of possessing this knowledge and skills, however, is not well reflected in the more traditional, ADDIE-like models of instructional design.

CHAPTER 3: METHODOLOGY

This chapter describes the methodology used in the study. After reminding readers about the research question, I explain my choice of methodology and describe the criteria used to select a research site and study participants. I then explain how the criteria was applied to find an acceptable research site and recruit participants; describe the research procedure used and my role as researcher; and, discuss data analysis and how credibility and trustworthiness were assured.

RESEARCH QUESTION

This study seeks to answer the following question:

Within the context of a specific workplace, how could participatory design be used to design instruction for workplace learning?

Ancillary questions include:

1. How does the practical implementation of participatory design differ from its theoretical presentation?
2. What practical challenges arise during the participatory design process that would need to be addressed in advanced planning?

3. What is the effectiveness of the resulting learning program in terms of achieving its intended learning objectives?
4. What type of change management issues arise for instructional designers who are experienced in traditional ISD methodologies?

CHOICE OF RESEARCH METHODOLOGY

Because the research question focuses on the feasibility of a particular type of design in a particular situation, the resulting study involved exploring a particular instance of using participatory design for workplace learning in rich detail. Studies that do so are considered to be case studies reflecting a qualitative research methodology.

Qualitative research is a methodology of inquiry that intends studying things in their natural setting. It strives to help researchers understand the meaning people construct of their own experience of the world and how they make sense of that experience. It seeks to not only clarify the nature of a problem but also the varieties of human action, interaction and emotional response they may have to it, Qualitative research therefore reflects the belief that meaning is socially constructed by individuals in interaction with their world (Merriam, 2002; Corbin and Strauss, 2008; Creswell et al, 2007; Yin, 2003).

Different types of qualitative research, or methods, can be used to gain an in-depth understanding of something and those involved with it. The case study method was selected for this study because it aims specifically at understanding a particular situation and its actors in a context. A case is therefore an account of an activity, event or problem that contains a real or hypothetical situation, and that includes the complexities encountered in real life situations (University of South Wales, 2005). Patton and Appelbaum (2003, p. 60) define a case study as,

> "An empirical inquiry that investigates a contemporary phenomenon within a real-life context where the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used. Case studies typically combine data collection methods such as archival searches, interviews, questionnaires, and observation. While quantitative data often appears in case studies, qualitative data usually predominates."

The case study methodology therefore seemed appropriate to study the phenomenon of participatory design. Given the complexity involved in documenting a case in its entirety - that is attending meetings, interviewing participants individually or in groups, observing activities and reviewing documents – the decision was made to focus this study on a single case.

RESEARCH PROCEDURE

This section describes the research procedure followed to perform the study. After reviewing the initial requirements used to determine which organizations and participants to seek for this study, I explain how I recruited an organization and participants for this study.

Characteristics of the Research Site, Project and Study Participants

As a researcher, my role in this process would primarily be observing it. I opted to observe the process and not directly be part of it for two reasons. First, I wanted to see how, and how well, a group of instructors would work together to co-create something that would help them become better instructors. I wanted to explore how professionals in the workplace could design together what they need to learn. Second, I did not want to improperly influence the project and its participants. Because some participants knew I was an experienced instructional designer who had previously designed instructional techniques courses, they might prefer relying on my advice more than working through design problems together. If I worked directly with participants, I might also become too influenced by my previous experience designing instructional techniques courses and either knowingly or unknowingly influence the group's work. If participants relied on an experienced instructional designer to guide them through the process

of designing an instructional techniques course, then the approach might not be participatory at all. It might instead become another example of a design expert working with learners to confirm his design instead of helping them design their own course. It therefore seemed more appropriate to mostly observe and intervene only as needed to help participants get unstuck, like a coach would do. I would not otherwise participate in completing various design tasks. .

So, to see participatory design in action, I would have to find an existing workplace in which I could observe the process. Recruiting a site would involve finding an organization that was willing to try participatory design, that offered an appropriate project to study and one that would involve a team approach to design, so that the perspectives of several types of workers would be represented.

First involved was choosing a location. Because this study was intended to inform the practice of workplace learning, it required an environment where workplace learning activities are regularly designed and implemented. Furthermore, because this study also investigated whether participatory design could serve as a methodology for designing instruction, the participating organization would have enough employees to train to warrant assigning at least one person to design and deliver the instructional program, perhaps more than one employee. Typically, the person who designs an instructional program is an instructional designer, but in some organizations, the task might be handled by someone with a different job title. The instructional designer would also

preferably be an employee because an external contractor might not want to use participatory design or might have a mandate incompatible with this study.

Another important criterion for selecting a research site included having a known group of employees to train, and a known training project to follow.

In addition, the organization participating in the study needed to be willing to support and facilitate it. For example, the organization would grant access to employees and allow site visits.

Last, the organization in this study should not have barriers to conducting participatory design. These barriers might include organizational objectives that run counter to the philosophy of participatory design, time limits that would preclude a participatory design process, problems accessing learners who would play a key part in this process, or pre-determined learner needs or pre-selected learning strategies that would preclude entering participator design with the flexibility to respond to the suggestions arising from it. Given these requirements, the research site would be a medium-size organization or larger, with at least 500 employees.

Next, the location had to have a project appropriate for the study. A first requirement for identifying such a project was that the location be a company or organization interested in workplace learning and actively involved in helping their employees learn at work. Organizations that were not interested in employee learning would not likely support a study on participatory design for workplace

learning. A second requirement was that the project be substantial enough to justify involving a team. Because not all projects related to workplace learning are large or difficult enough to involve a team and because this study sought to explore how having individuals participate in a design process might improve that process, it was important to find a project with enough work or complexity to justify a team effort. At the same time, a third requirement was that the project be small or manageable enough to fit the time frame for this study of between 6 and 9 months. A fourth requirement was that the project be formally approved and supported by the organization.

The third aspect of choosing a site was the participants. As noted earlier, the project needed to employ a team. Each member of the team would play a defined role and would bring a unique set of skills. Typically, instructional design teams have people playing at least these two roles:

a) Instructional Designer. The instructional designer is typically someone with formal training in or sufficient practical experience with creating learning activities. In the workplace, instructional designers plan the overall structure and flow of one or more programs intended to engage working adults in the process of acquiring new knowledge and skills. They work closely with other professionals - including Subject Matter Experts (SME) - to determine which content to present, how to present it, the conditions under which learning should occur and the results to achieve.

b) Subject Matter Expert (SME). Subject Matter Experts are individuals with sufficient expertise in a domain to answer questions from others, describe work processes or procedures, identify job tasks for which training may be needed and prepare content for learning. SME are typically recognized by management and their peers as being more experienced or having greater expertise than they do and therefore the source of good advice.

A third role is that of the project manager, who assumes the overall responsibility for successfully planning, monitoring, controlling and closing a project. An effective project manager may also need to be a good coach or advisor to team members and to project stakeholders. In smaller projects, the instructional designer may also assume the role of project manager but in larger projects that role is typically assigned to someone with formal project management training.

These participants in the study would be employees performing their regular duties within the organization and who:

- Were personally concerned about what was designed or otherwise personally interested in the project and proposed outcomes.
- Were willing to participate in this study.

Research Procedure

The research procedure included these key tasks:

1. Gain entry into the organization.

2. Review the research project with stakeholders.
3. Recruit team members.
4. Lead initial project meetings.
5. Collect data about the participatory design process.

The following sections describe these tasks in more detail.

1. Gain Entry into the Organization

Gaining entry into the organization started by identifying organizations that, based on the requirements identified earlier, could serve as a research site. Initially, any organization, public or private that could meet the selection criteria was considered. Recruiting potential sites was done in two or three steps. When it was clear who to contact in an organization, the process included two steps: a first one to send an initial request for participation by email, with documents attached explaining what the study involved; and a second one to follow up by telephone with those who expressed interest in participating. A third step was added when it was not clear who to contact in an organization: the first step was then to send an email to a general address requesting the name and coordinates of an appropriate contact; the second step was to contact that person by email and send the study documents; and the third step was following up by telephone when relevant. The process followed to identify and approach potential study sites was documented in

a series of tables each identifying the action taken, the people contacted, the date and time and any relevant follow-up action.

Two documents were written to help with the recruiting process. The first, a Call for Participation, would be sent with the introductory email. This Call for Participation outlined in a question-and-answer format what the study involved and the specific nature of the request to participate in a study. It addressed questions about who should participate (organizations and employees), what participating would involve and expected roles and responsibilities (including those of the researcher). The answers to these questions were sufficiently general to help prospective organizations decide about participating in the study. The document identified that the study was about participatory design, but did not discuss participatory design in detail nor refer to an established ID model. Participatory design was described instead as "an approach that recognizes the importance of fully involving users and other stakeholders in a design process... The cornerstone of participatory design is participation - a process in which two or more parties influence each other." See Appendix A for the Call for Participation.

The second document was written more specifically to answer additional questions an organization interested in participating in the study site might ask. It described the study in more detail, introduced the four-phase participatory design process described in the literature (project framing, design sessions, application

and results analysis) and explained what the organization's role would be in the study. To avoid possibly biasing the site, there was no mention in either document of any specific instructional design model or step within a model, like analysis or design. See Appendix B for this document.

There were four reasons to proceed this way. First, the generic ADDIE model is well known in the workplace and is often assumed to be how instructional design is carried out. The researcher therefore felt it was important to describe participatory design in a way that would not confuse it with ADDIE or other models of instructional design. Second, the process described included sufficiently broad phases to leave as much room as possible for a project team to eventually decide how to approach this instructional design project. Third, the documents avoided focusing attention too quickly on one or another part of the work (a step or activity, for example) and focus instead on understanding participatory design as a collaborative approach. And fourth, answers were kept as simple as possible to avoid confusing potential participants with excessive detail. See Appendix C, Participatory Design for Workplace Learning, for this recruiting document.

This process eventually allowed identifying a department manager at a learning institution of the Canadian government (herein the Institute) who expressed interest in my research. This Institute is the body within a Special Operating Agency of the Canadian government that is responsible for preparing

new recruits for operational duties and continually updating the knowledge and skills of existing employees. My contact was the sponsor of the project.

2. Review the Research Project with Stakeholders

The next step after learning that the Institute was interested in participating in this study was to confirm that the contact person there had received and read the Call for Participation. I then answered additional questions and wrote a second document on request by my contact to more specifically address questions like, "Who should participate?" and "How much time is involved in participating in the study?" That discussion eventually led to identifying a project that would meet the needs of the Institute and the requirements of this study.

The Institute initially identified two possible projects that could be used for this research. The first one would focus on designing an instructional techniques course for new instructors at the Institute, while the second one would focus on designing a new section for an existing course on handling difficult operations. I reviewed the projects together with my contact and a member of his staff (who became the project manager) and agreed that the first one was better since it allowed starting the task of designing a learning experience from scratch rather than continuing a design effort already underway.

Work to set up the project started nearly as soon as a project was identified, but stopped again within a few days so that senior management could address concerns raised by a department head about the course. When I first learned about this situation, it appeared necessary to switch projects and work on the operations course instead of the instructional techniques course since it could take some time to resolve the issues raised. It would indeed take a few weeks for management and department heads to work through issues and decide where to focus their efforts. Because I was not involved in these discussions, I learned afterwards that the project to design an instructional techniques course for new instructors at the Institute remained a priority and that work on this project could start.

This course on instructional techniques was seen as an essential first step to improve standards of quality in instruction in the Agency (that is, not only Institute instructors, but all instructors in the Agency). This course would be structured using a traditional *face-to-face* format – that is instructor-led, group instruction in a classroom setting. The Institute had partially made the choice because face-to-face was the accepted format for instruction at the Institute and partly made the choice because it lacked the necessary resources to create learning activities in other media, like e-learning. Because all instructors would eventually take the course, management at the Institute saw participatory design as a way of involving all departments in creating 'their' course and therefore gaining support

for the new instructional standards. As discussed in Chapter 2, participatory design focuses not only on improving workplace tools and processes but also on empowering workers to develop resources that will meet their needs. So participatory design reflected well management objectives for the project: encouraging instructors to co-determine the essential competencies of their jobs and helping new instructors acquire these competencies through a well designed course. At the very least, management hoped this collaborative effort would create rapprochement between instructors, departments and management. Management at the Institute deplored in particular that departments had become isolated from one another and tended to work in silos. Senior managers therefore hoped that this project would become a catalyst to break down silos, encourage cooperation and develop shared instructional standards that all instructors would follow.

The Institute therefore met all selection criteria. It was:

- Part of an organization with thousands of employees.
- Directly involved in workplace learning.
- Ready to start work on designing a new course to meet important needs.
- Interested in participatory design.
- Willing to support the project.
- Presented no known barriers that could prevent completing the research project as intended.

The person at the Institute who initially received the request to participate in this study and became my contact was then the head of a department offering operational training. After discussing the study together, he agreed to recommend it to senior management, and more specifically to the Academic Director who oversaw all departments. Because he was also about to go on extended leave, the department head delegated the responsibility for managing the project to Peter, one of his instructors. Peter was then one of a few instructors at the Institute with at least some experience and expertise in both instructional design and project management. After the department head went on leave, the Academic Director became the project sponsor and a key stakeholder representing the Institute's executive team.

3. Recruit Study Participants

From the start of the project, there was some concern about team member availability and having enough time to devote to the project: because the Institute was short of instructors when this study was conducted, those who participated in the project (and the study) were taking on an additional responsibility. To make sure that team members had the time for this project—and this study—early in the project, the project manager asked management to allot as much work time as possible for this project to members of the design team. Although management agreed in principle and supported the project, members of the core team often had

many job-related demands on their time and their availability for this project became an issue.

Even though the Institute, project sponsor, and project manager had all agreed to participate in the project, others involved in the project would have to individually agree to participate in it. To recruit them, I prepared a third document addressing questions I felt would be more important to prospective participants, such as how much time and effort they would likely be asked to contribute to the project and what their involvement in the research entailed. See Appendix C for this Call for Individual Participants. Once the Institute confirmed its participation and selected a project, I asked the project manager for his comments on the Call for Individual Participants. After he confirmed it was acceptable, he sent it to all prospective participants – that is to all instructors at the Institute.

The project manager first sent an email with the Call for Individual Participants to instructors in each of the departments in the Institute, noting that their participation was voluntary. We hoped to form a project team with at least one instructor from each department. Six instructors volunteered and eventually became the nucleus of the team. I was copied on most email exchanges during the project; the messages are part of my study data. I also requested that each participant sign a copy of the Call for Individual Participants and return it to me

before starting. I received signed copies from all members of the core team but not from members of the extended team.

Because this initial group of volunteers did not include representatives from all departments, some departments and instructors were asked more directly to participate, although participation was not imposed. Some instructors who later joined the team did so reluctantly and declined to participate in the study. They were therefore not interviewed. They were considered instead part of the project context and their influence on the team and the project was analyzed from that perspective.

Those instructors who volunteered for the project participated in all parts of it. Those who did not volunteer for the project only participated sporadically. Those who participated regularly eventually formed a core team while others became part of an extended (or peripheral) team (Carliner, 1998). Core team members are central to the project and play a key role in all aspects of the course design and development. Core team members were responsible for designing, developing and pilot testing the course. Extended team members are ones who played peripheral roles on the project and helped core team members by reviewing and commenting on the work.

Most instructors who participated in the project, including those from both the core and extended teams, held indeterminate instructor positions at the Institute. In the Canadian Public Service, the term ‘indeterminate’ is used instead

of ‘permanent’ or other terms to represent continuous rather than temporary employment. One instructor from the core team, who also occupied an indeterminate position there, worked on the project mostly remotely since he lived in another city than where the Institute is located and had arranged to telecommute or work from a regional office, and travel to the Institute from time to time as needed to complete assignments. He spent a few weeks at the Institute during the project, during which he attended meetings in person and worked face-to-face with other team members. Another member of the core team who worked onsite at the Institute occupied a temporary position but remained available for the entire project and completed it before being re-assigned elsewhere. The final team composition met the established criteria in terms of numbers (6 members (Birmingham and McCord (2002)), of levels of participation and engagement (all core team members participated fully and willingly), and in terms of reflecting the characteristics of the target population.

All volunteers were asked to confirm their decision in writing by receiving, signing and returning the ‘Consent Form for an Individual Participating in a Study on Participatory Design’. (See Appendix D for a sample of this form). In my first interview with each team member, I confirmed they had read the Consent Form and answered their questions as needed. Nothing happened during the study to suggest participants either did not understand their role, were mislead into agreeing to participate or otherwise forced to do so.

To protect anonymity, study participants were identified with fictitious first names only while other instructors were simply identified as Institute faculty. As previously stated, participation was voluntary and participants did not receive additional compensation or special treatment.

4. Lead Initial Project Meetings

Once the team was assembled and the project formally underway, I co-led an initial team meeting with all team members. The project manager was the other co-leader. The purpose of the meeting was for team members to introduce each other and to introduce myself to the team, review project objectives, answer questions about the project and about participatory design, and start a team building process. Some team members worked in the same department and knew each other well, but others worked in different departments, had fewer opportunities to work together and therefore did not know each other as well. After personal introductions, the project manager reviewed the project and expected outcomes. He confirmed with team members the need to work closely together and to actively participate in all aspects of designing the instructional techniques course. The team also reviewed the project timeline, the type of assignments they might be given and how much time and effort the project might require. I prepared the meeting with the project manager, confirmed what to cover and chaired the meeting with him so he could also review management

expectations and discuss next steps with the team. Although I co-led this meeting, the project manager organized and led future meetings, kept the team on track and interacted with management.

At the team's request, I led one other meeting after this initial one. Shortly after our first meeting, the team asked that I provide them with more background on instructional design. I agreed to lead a one-hour session during which we briefly discussed what are design and instructional design, how participatory design differs from other models of instructional design and how it could be used in the project. Once again, I focused on presenting and explaining concepts and principles while avoiding suggesting specific actions or actually participating in the process to maintain my role an observer of that process.

Whenever I attended or participated in a meeting, I was always concerned about improperly influencing the project. On the one hand, I had previously offered to help participants get started or unstuck if needed and did not want to turn them down when they asked for help. On the other hand, I remained acutely aware that I could improperly influence the project if I was either too directive or otherwise perceived as wanting the team to take specific action. Because of this, I carefully prepared for meetings and tried during meetings to always keep an acceptable balance between answering questions and offering advice, and avoiding being directive. I therefore tried exploring options with participants instead of suggesting taking specific action.

5. Collect data about the participatory design process.

Data were collected throughout the study using various sources and techniques, including the following:

- Observation. In addition to the first meeting, I attended other team meetings. Because the team and I were in different locations, I attended most team meetings via teleconference. When doing so, I recorded the audio portion of meetings and transcribed them for later analysis. I also took meeting notes to better understand the context of each meeting and how it influenced the team's design work.

  In addition, I was able to attend the pilot course in person, spending ten days on-site at the Institute. During that visit, I could observe not only the pilot course, but also the interaction among the staff. Observations focused not only on the work being done or the activities taking place, but also on verbal and non-verbal interaction among instructors as well as interactions between instructors and management that further helped clarify the organizational context.

  In all instances, I recorded what took place, under what circumstances, who was involved, the issues that surfaced, decisions made, results achieved and all other comments relevant to the study. I regularly reviewed the data gathered from various sources to identify inconsistencies, areas where data may be missing or be otherwise

incomplete, problems with the project or issues to investigate. When in doubt, I checked my notes with the project manager and other team members to confirm correctly understanding events, activities or decisions.

- E-mail. Given the distance involved (the team was located in one place, with one team member working remotely, and I was in another location) electronic communications played an important role in monitoring team activities and staying involved on a daily basis. The project manager and team members shared information and activities with one another and copied me on their correspondence. I also used email to arrange interviews and to request information that was not immediately available to me. Some email messages addressed project and business issues while other email messages were more personal, exchanged with one individual or another directly and therefore not always shared or discussed with other team members.
- Interviews. Interviews provided me with an opportunity to formally speak with participants in the study. I interviewed each participant at least three times during the project – within the first month after formally getting started, about mid-way through the project (approximately 4 months later) and near the end of the project (approximately 8 months after starting the project). I also interviewed the Academic Director as a key management

representative and stakeholder. Because I was not able to interview him mid-way through the project, I interviewed him twice, once at the start of the project when I first interviewed team members and again at the end of project.

Most interviews were semi-structured, private, one on one conversations conducted by telephone. I was also able to interview some participants in person during my visit to the Institute for the pilot course. Interviews typically lasted about one hour: one was shorter and lasted about 30 minutes while two others lasted over two hours. Only one interview ended prematurely because of an unexpected interruption: all others were completed as planned.

As semi-structured conversations, interviews typically started with scripted questions and proceeded from there to explore any topic that may become important. For example, I scripted 5 questions (along with relevant sub-questions) in preparation for my initial interviews with each project participant. In later interviews, I scripted three or four questions about the latest events in the project to which I added more specific ones as needed to clarify or further explore what was discussed during the interview. See Appendix E for sample interview questions, for those used during the initial interview and those used in a subsequent interview. Although I did not provide participants with an interview guide before

each interview, I started them by reviewing proposed topics for discussion, confirming these topics with participants and inviting them to suggest other ones as needed.

- Interviews therefore generally followed this pattern:
  - Contact the person to interview by email to schedule an appointment. This request for an interview outlined the purpose of the interview and proposed a meeting time.
  - Casually open the interview and set an informal tone.
  - Start with an open ended, general question that allowed those interviewed to either make general comments or guide the conversation towards points that were important to them. For example, some participants quickly brought up issues that irritated them.
  - The first question was followed with more specific ones on the project, the participatory design process, problems encountered, team dynamics, organizational issues and other important topics that had come up since the last interview.
  - More spontaneous questions were used to explore issues that might come up during the interview.

- The main points discussed were reviewed and participants invited to make additional comments or ask questions before closing the interview.
- Participants were thanked for their time and collaboration and the interview ended.

The interviews allowed exploring expectations, perceptions, successes and difficulties, achievements and group dynamics. The experience of using participatory design was discussed with participants by enquiring about time and effort, activities completed, difficulties collaborating and using participatory design for this project.

In addition to the one-on-one, formally scheduled interviews, a few interviews occurred spontaneously. For example, one team member called me to discuss the project. I also used team meetings as a form of group interview.

Forty-one interviews were completed during the study, including thirty-seven that were recorded and transcribed for analysis. Because it was not convenient to record the other four interviews, I took careful notes during the interviews that I transcribed immediately after.

- Documents. Numerous documents were reviewed during the project that were either prepared by the team or by others at the Institute. These documents included reports, memorandums, policy documents, discussion

papers and multiple versions of design documents, from initial drafts to complete instructor and student manuals, which were shared via a web-based content management system. Documents were particularly useful to understand the context at the Institute and project background, as well as to track progress via iterative versions of the course documents.

Data was collected between April 2009, when the Institute formally agreed to participate in the study, and May 2010, when the course pilot was completed and a final report on the project was submitted to the Academic Director of the Institute.

THE RESEARCHER'S ROLE

Participatory design emphasizes the active cooperation between researchers and those studied, so, in addition to someone observing and documenting a case , the researcher can play a role in the project. However, Because I am an experienced workplace learning practitioner who has designed many different learning activities for the workplace, including different courses on instructional techniques, I felt it was important not to participate in designing this course or otherwise interfere with the team's work. I believed it would be difficult not to communicate my experience which could then introduce bias in how the team thought about design and approached designing this course. I did

not want to risk completely changing the course of the project: I wanted to play as limited a role as possible and clearly focus on exploring how a team of workplace professionals tackled designing a course together that would meet their instructional needs. Recognizing, however, that the team did not have prior experience with participatory design, I settled on the role of trainer and consultant on participatory design. After providing that background, the team would be responsible for using participatory design on its own.

With this in mind, my role in this project became that of facilitator, observer and recorder. As a facilitator, I primarily helped the team leader understand and apply the principles of participatory design while managing the team's activities. More specifically, I:

- Briefed all those involved as needed on the purpose of the research and what to expect;
- Led a work session to introduce participatory design, review key principles and discuss how they should be applied during this project. The session explored,
    - What is participatory design.
    - How it works.
    - How team members should contribute to it.

- How to get the team ‘unstuck’ (for example, encouraging tackling problems from different perspectives), or otherwise keeping the process going.
- The role of the team leader and how it may be different from his/her role in other instructional design projects.
- Working through disagreement or conflict.
- Dealing with unexpected problems like changes in project scope or requirements.
- My role as researcher and how we would work together.
- Potential problems and how to address them.
- Expected outcomes.

As a researcher I,

- Interviewed team members and stakeholders.
- Attended meetings either by teleconference or in person. Because I was physically separated from the team (I live and work in a different province than the Institute), we interacted mostly by email and other computer-mediated technology, or by telephone. My role during meetings was to follow discussions and the team’s work, take notes and otherwise track progress, and to occasionally comment during more general discussions on topics like learning and instruction. I remained keenly aware throughout

the project of the need to balance helping the team when needed and allowing them to proceed as they desired.

- Observed ongoing activities: I attended the pilot course during which I was able to meet and discuss the project directly with team members.
- Kept notes and detailed records of what occurred during the project.
- Reviewed documents and other information.
- Returned to the literature as needed to further inform notes or observations. For example, I investigated methodologies to deal with complex or ill-defined problems, or to better reconcile clashing wants, needs and desires.
- Helped teach some course sessions during the pilot.

I was neither directly involved in the instructional design process nor led the team at any time. I relied instead on the team's decisions about what to do and how best to do it. Because this study examined how well participatory design works in real projects, I did not interfere with or otherwise try to influence discussions or decisions about any issue or event that did not directly impact the study. For example, although I was interested in efforts to introduce new work processes and tools, I was not involved in these discussions. I did, however, closely follow developments and request clarification on the project status when unexpected delays occurred that seemed to put the study at risk. When asked, I offered advice much like a coach would do. When doing so, I offered options and

made suggestions instead of directing or requesting action from the team. This was important to investigate how the group handled the design task they were given.

Before the pilot course, I agreed to help lead some sessions because Peter was the only instructor available for the pilot and because I would be at the Institute to observe the pilot. My responsibility as an instructor during the pilot was limited to instructing two sessions: a first one on the first day of the course and a second one the next day, as they were designed. It was therefore similar to what would be expected of a consultant hired to teach an existing course.

DATA ANALYSIS PROCEDURES

As discussed earlier in this chapter, because the research question focuses on the feasibility of a particular type of design in a particular situation, the resulting study involved using a qualitative research methodology. to study the use of participatory design for workplace learning. Given the complexity involved in documenting a case in its entirety, the decision was made to focus this study on a single case.

This case was defined by using participatory design to develop a specific course on instructional techniques to meet the needs of working individuals. The case is bounded by taking place at the Institute, a specific part of a larger

organization, by using participatory design and not other models of instructional design, by focusing efforts on creating a single course within a larger program at the Institute, and by focusing on the experience of a specific group of individuals that participated in the study. This case was also bounded by time, taking place over a period of 12 months.

This study therefore focused on documenting and understanding the experience of a specific group of people that used participatory design to co-create a course on instructional techniques within an established learning institute. To better understand this case, information was gathered on the Institute as the project environment, on those who participated in the project, on the design process – how it occurred and specific outcomes – and on factors that impacted the team and the project.

The data gathered during this study was mostly in the form of written documents or audio tapes that were transcribed into documents. Before starting the analysis, the researcher confirmed that all relevant information was documented in writing, and that it could be used as needed for data analysis. Documents were labeled, arranged by date and organized into a hierarchy of topics that facilitated and guided data analysis. Researcher notes, notes obtained from participants, interview transcripts, work documents, records of conversations, meeting summaries and other data were therefore captured, stored electronically and prepared for analysis.

The first step to analyze the data consisted of reading through the documentation to become more familiar with the details of the case, identify recurring ideas or themes and annotate them accordingly, and build an overall understanding of the case. Because working with documents alone did not support data analysis well, all data was entered into a database created specifically for this purpose using Microsoft Office Access 2007. In it, I identified individual pieces of data but also ways to link data together as needed. For example, I could link an email message to a project document identified in the email or recreate the entire timeline of the project. I decided to build my own database after trying qualitative research software because I was familiar with the database software and therefore felt comfortable I could create a data management tool that would meet the needs of this study and allow me to more effectively manipulate the data during analysis.

Data Gathering and Analysis

Building a database to better review and manipulate the study data was not the only technique used to analyze the data. Data analysis started instead by (and eventually relied on) coding the data to identify key concepts, ideas, events or behaviors. Data coding and analysis was completed in a number of steps. First, I gathered, read, organized and annotated the case documents. The purpose of this step was to develop an overall understanding of the case and confirm that the data

gathered allowed further analysis. Because I did not yet at first have a good understanding of the codes that would best represent the meaning of the data, I started by annotating the documents with comments in the margins and by highlighting relevant passages without trying to trying to follow any particular coding technique. It is during this step that I decided to create a database with the flexibility needed to search through the data, explore the relative importance of ideas or events (by searching for occurrences, for example) and organize them for analysis.

The next step therefore consisted of creating a database for deeper analysis. I used Microsoft Access for this task because I was sufficiently familiar with this application to quickly create a simple but effective tool that let me more easily manipulate and search the data. Each record of the database included a field for notes in which I entered my comments from previous work. After entering them, I was able to use the database's search function to start identifying patterns and connections. Because each record was also identified by date and time, developing the database allowed me to recreate the project timeline which helped me reconstruct and re-connect with the entire case. Data from different sources was also compared to create thick descriptions of discussions, interaction, group work and participation in the design process. Data was checked for congruence, contradictions or inconsistencies in ideas, opinions, perspectives, actions, discussions. Additional data was gathered as needed to further inform, validate or

invalidate perceived themes or trends, and data was checked with participants to confirm it was entered and interpreted correctly.

This work with the database allowed me to start gaining insights about the meaning of the data. . For example, I was able to link one comment from a core team member about feeling frustrated with unequal participation from all team members to similar comments from other core team members that eventually became a theme about the personal experience of participating in the project.

I regularly reviewed the data and further annotated it during the study to confirm trends or expand links between items. For example, I took notes on:

- The purpose of meetings, how well the agenda was addressed, meeting attendance and variance in participation, unexpected agenda items that surfaced during meetings and how well the team dealt with difficult or problematic situations.
- The interaction between team members; for example, how arguments were presented and received, and differences of opinion resolved.
- Key questions or issues raised, either about ongoing tasks or project outcomes.
- Issues raised specifically about participatory design, either in terms of process, team work, difficulties or outcomes.

When reviewing the data, I regularly checked my notes against the documents received, the email exchanged with participants and with the

participants themselves during interviews to ensure they reflected well the events that took place, the dynamics involved and how participants felt about them. For example, when it became apparent that team members were reacting against a possible change of mandate, I returned to the study documents to first confirm what was involved and how it came about, then asked the team leader during our next interview to formally explain the change and why it was introduced, and finally asked each team member about it during their next interviews.

Researcher's Log

During the study, I kept a researcher's log, recording my own observations on the interest and engagement of individual team members, on emerging team dynamics, on the process followed, on design decisions and dealing with design problems, and on results achieved.

The log began as a series of loose notes that I took about meetings, email exchanges, concerns about the project or about the project participants that I entered in a word processor to complement other information or help understand events. For example, I wondered there about the nature of the initial delay starting the project and how it would affect the study. Later on, I commented about my concern for Peter's health and recovering from a serious illness. I also wondered how this change of events would affect the project and noted my relief in finding that core team members took it upon themselves to complete the project.

Over time, I transferred the contents of my log into the database to better organize these notes and use them for analysis. I kept all original notes, however, to review them as needed.

Data Coding

While creating and working with a database was a very useful exercise, I also coded the data using a procedure proposed by Corbin and Strauss (2008) to develop Grounded Theory. They propose that coding should evolve gradually through a three-step process identified as open coding, axial coding and selective coding.

Open coding consists of "breaking data apart and delineating concepts to stand for blocks of raw data" (Corbin and Strauss, p. 195). As a first step to code the data, I read again all documents gathered during the study to identify more specifically the ideas, concepts or events that should be noted. At first, I entered codes in the margins without following any particular pattern. I was more concerned with identifying important elements from the data than categorizing or explaining them. The codes developed through this exercise were therefore typically short sentences that highlighted an idea or event. For example, "difficulty getting resources", or "rapid prototyping as a shotgun approach to ID". As I progressed through open coding, I gradually began seeing how these short

sentences could be summarized using key words. For example, I eventually replaced the sentence on rapid prototyping with these two words only.

After completing this initial coding exercise, I entered all codes into a list of codes that allowed further comparing them and performing axial coding. Axial coding involves crosscutting or relating concepts to each other (Corbin and Strauss, p.195). It is essentially exploring the relationships between categories and making connections between them (Gibbs, 2008). Through this exercise, I identified categories of recurring concepts or events and therefore created categories like 'availability' that included participant concerns about their availability to participate and how this affected the project. Other categories included team dynamics, design and participatory design, the context, the standing committee, the project structure and project management, the [organizational] transition process, resistance to change and conducting the pilot course.

The next step of the coding process involved selectively grouping the categories identified into themes reflecting strong patterns that could be verified by triangulating data from various sources and that provided a broad but comprehensive picture of the collective experience of the study. The following themes emerged from this exercise:

- The personal experience of using participatory design.
- The team experience of using participatory design.

- The influence of context on participatory design.
- Project management and the need for structure in participatory design.

TRUSTWORTHINESS AND CREDIBILITY

To protect participants, all were provided with anonymity and confidentiality. All participants are referred to by pseudonyms, as is the organization. To further protect participants, I eliminated specific references to the contribution of individual participants in this and other reports not specifically intended for the Institute's management. (Given that the recruitment was handled by the project manager, the Institute was aware of who was participating in the project.)

All formal design documents were identified as coming from the design team rather than from particular individuals.

The following techniques were used to ensure data trustworthiness and credibility of the data:

- Triangulation of data by relying on multiple data sources. For example, I compared observations of the pilot course (including the behavior of the instructor and of course participants, and levels of participation) with statements in the interviews (for example, how team members described

their participation in work sessions) and the results achieved (the project outcomes).

- Counting and linking events (when relevant) to support conclusions.
- Reviewing data records to ensure they were complete and accurate.
- Conducting member checks by asking core team members to review and confirm interview transcripts for accuracy (Seale and Silverman, 1997). This was done in a number of ways: first, I immediately confirmed with participants the meaning of information I received when it was not clear or when I needed more information to fully understand the issues raised. For example, when I was copied on an email from Peter to other team members about welcoming new team members, I contacted Peter to clarify what this meant and annotated the email accordingly. Second, when preparing for interviews I added specific questions to check about events or issues that occurred previously or that were mentioned by one participant or another. For example, when it became apparent that core team members were not happy with possibly transitioning to another role, I checked with each one why this concerned them. Third, I often shared with participants my own summaries of events or of their comments to confirm they were accurate and reflected the study well.

Rigor was maintained by reviewing the data regularly at different times during the study. For example, the data was first examined when initially

collected and before being coded, when it was coded and again later when it was organized into a database.

LIMITATIONS OF THE STUDY

There are three main limitations to this study. First, as a case study, it cannot be readily generalized to other cases or to participatory design as a field. Second, the number of participants is small and they were not randomly selected which further limits the study. And third, because I was not able to attend all the design meetings in person, I could not directly observe the interpersonal dynamics that took place during these meetings. Although the study results do not generalize, they are transferable. It should also be noted that because this study explored specifically whether or not participatory design could be used to address a practical design problem for learning at work, it did not consider many other possible questions like the links that may exist between participatory design and team learning.

CHAPTER 4: ABOUT THE PARTICIPATORY DESIGN PROJECT

This study of participatory design as an alternative to traditional instructional design for workplace learning involved following a team of instructors who worked collaboratively and with other prospective learners to design, develop and deliver a course on instructional techniques for new instructors at their Institute.

This chapter describes this participatory design case. It first describes the organizational context in which the course was developed, and then provides a background on the course assignment. It next describes the key participants in the design of the course and closes by describing each phase of the process for designing, developing, and delivering the course - emphasizing how the participation of prospective learners affected the course design.

ABOUT THE ORGANIZATIONAL CONTEXT

As noted in Chapter 3, this study took place at a learning institute (which for the purpose of this study is called the Institute) dedicated to meeting the needs of an agency of the Canadian government (which for the purpose of this study is called the Agency).

About the Agency and Its Learning Staff

The Agency has its headquarters in Ottawa, the national capital, and employs approximately 10,000 people in locations in every province and territory in Canada.

Of those, the Agency has in total about 300 instructors providing learning programs to its employees in various regions. The top executive for learning is based at the Institute, and has four executives reporting to him. The Executive Director is the head of the Institute, who reports to the Deputy Commissioner of operations at the Agency.

About the Institute, Its Programs and Its Staff

Established in 1965, the Institute is one of the most important learning centers that is owned and operated by the Canadian Government. Based in a single location in Canada's Maritime region, the Institute offers a variety of workshops, courses and other learning activities for both new and existing employees that can be generally grouped into two broad programs: an academic program for new employees and a Professional Development program for existing ones.

The Academic and Professional Development Programs

The Academic Program is the smaller of the two programs. It is an accredited, university-level program covering science-related subjects leading to a Bachelor of Technology degree. It is attended by traditional college-age students of both genders, from English and French Canada, who will apply their education in specialized positions in the agency. Many of these positions also require licenses and operational certificates, so learners not only earn the degree, but also the appropriate professional credentials required for their jobs. The academic program follows a semester system.

In contrast, the Professional Development program offers non-academic courses of study to prepare employees for positions. This program includes a few courses lasting up to six months but offers mostly a variety of shorter courses lasting a few days to a few weeks to develop job-specific skills like maintaining equipment and handling emergencies. All participants, whether they taught in the Academic or Professional programs saw fundamental differences in the goals of each program, the type of instruction offered and the standards applied.

The two programs do not share equal status in the Institute. Participants from both the Professional Development Program and from the Academic Program commented that the Academic Program is considered less important for various reasons. They identified two of them in particular. First, the Academic Program only represents a small portion of the Institute's activities. In 2011, for

example, the Academic Program accepted only 64 new employees while the Professional Development program will serve hundreds of employees. The second reason is different perceptions about the role of the Institute versus that of universities, and that academic courses should be offered by universities instead of by the Institute.

Because the academic program is part of the process to recruit and train new employees, and because the Agency's needs to hire personnel changed over time, the perception of the value of this program also changed depending on the need to recruit individuals willing to undertake a career with the Agency.

The role and importance of the Academic Program has therefore often been questioned and support for the program fluctuates over time. As a result, instructors from the Academic Program often feel slighted and more vulnerable to changes than those in professional development.

The Institute's Instructors

The Agency considers the Institute to be its most important asset for staff education and professional development, but training is also offered regionally as needed by instructors typically recruited from the field to serve the "85% of [employees] dispersed throughout Canada", as noted by the Academic Director at the Institute. In fact, the Agency expects the Institute to lead efforts to identify

and implement instructional standards throughout the organization and that would apply to instructors in the field.

To carry out this mission, four senior managers report to the Executive Director of the Institute, including Larry, the Academic Director who participated in this study and is the executive in charge of the program observed.

Central to the staff in the Institute are the instructors. Qualifications for instructors differ among the Academic and Professional Development programs. Instructors in the Academic Program must hold advanced degrees in their field. Instructors in the Professional Development program are subject matter experts recruited from the field for their experience and expertise. Professional Development instructors are typically people with sufficient work experience, and necessary professional credentials (like certificates of competency), to credibly transmit essential job related knowledge and skills to their peers.

Few instructors in either program are formally trained educators familiar with instruction, instructional design or workplace learning. As my initial contact at the Institute explained, “people that come from the field have never had any kind of training at all to be an instructor... We're bringing in subject matter experts most of which don't have a background in education and we're turning these guys into instructional designers and course deliverers”. Larry, the Academic Director added, “Our instructors are not teachers: they are subject matter experts that teach!”

Although instructors in the Academic Program tend to hold higher degrees than their colleagues in the Professional Development program, instructors in the Academic Program are no better prepared than Professional Development instructors to design and teach courses. One of the core team members from the Academic Program noted,

> "I basically teach [courses] the way I used to teach at the university. We were never introduced to lesson plans and things like that; we were just strictly told this is what we're covering and this is how much detail we expect. Now go and prepare your lectures."

He therefore relied on provincial curriculum requirements and his own expertise to structure courses, and on reputable textbooks for relevant content.

The Organizational Culture of the Institute

As previously indicated, the Institute is located in Canada's Maritime region in an area that is well known for its natural beauty but that is also away from larger urban centers. Partly because of this, recruiting qualified instructors willing to move near the Institute to continue their careers there has been difficult at times. As a result, some departments at the Institute had trouble replacing their instructors that left and remain fully staffed. This situation eventually affected the work conditions of instructors generally at the Institute. In one of our first

interviews, Peter, the instructor who became project manager for this project, summarized the situation in these words:

> "Lots of stress, over work, can't attract quality instructors to the Institute because, number one people don't want to move [here]. Number two, they don't want to leave the system under which they are working and that determines work days and days off… That means that people that are here are over worked and the efficiencies that can be realized with some of the things that we're doing are being viewed as godsends, but a lot of work to get us there."

Instructors are typically recruited to teach at the Institute because of their operational expertise more than because of any formal background in teaching or in education. Perhaps because it was difficult to attract people willing to move near the Institute, it was also difficult to attract senior managers willing to stay at the Institute indeterminately and provide ongoing leadership. As a result, a number of executives assumed leadership roles at the Institute over the years, but none stayed long enough to provide leadership continuity. As Dan, a member of the core team explained during one interview, "Well there's been changes constantly since I've been here. I've only been here two years and I've gone through I think four or five supervisors and a couple of directors."

Participants in this study also noted that the Institute tends to be a more traditional organization in terms of culture and work habits, and can be set in its

ways. For example, one study participant explained that his department uses the space available in science laboratories to temporarily stock instructional materials before they are distributed to students or used in class, which raises some concern about safety in the laboratories. But "they've been doing it for years and years, so… nothing's gonna change." The Institute is therefore best seen as a well established organization with an honored history, tending to implement change cautiously.

Part of the culture in place at the Institute also reflected an informal way of classifying occupations in the Agency that made some of them more important than others. In this study, members of the core team were well aware that two of their members were not given the same consideration as other instructors at the Institute because of their previous work experience and occupations. In this environment, some instructors would therefore regard engineers more highly than communication experts, for example.

About Recent Efforts to Change the Organizational Culture of the Institute

Although historically a hierarchical institution, in recent years the Canadian federal government has committed to more fully involving public servants in the decision making process. With this in mind, the Institute has tried to more fully involve its staff in decisions about instructional processes and standards. There are, however, important difficulties to overcome to achieve this

objective. As Larry, the Academic Director, explained, ensuring participation often slows down decision making, which goes against an operational culture that values quick decisions and actions.

> "Instructors come from an operational world, and when we say operational we mean people trained to decide quickly. Now, you have to pull yourself out of that way of doing things to work in committees, consult or participate. That's harder."

In part to address this need for greater collaboration and participation, the Institute launched a transformation project in 2008 to emphasize quality control and standardization in all its programs. The Institute wanted to address particular problems arising from having each Department individually decide how to design and teach courses, which caused problems of standardization between programs. It wanted to open communication between departments, break down silos (set up a more informal work structure and improve the flow of communication) and increase collaboration between individual instructors and between departments to standardize instructional processes and procedures. Part of this effort towards greater standardization included designing an instructional techniques course so that all instructors at the Institute would consistently use proven instructional techniques to teach their courses.

Larry was hired to lead this transformation project. He described his position by stating "[it has] existed since 1979 although there were a few

iterations of roles and responsibilities over time. But since 2008, [the Agency] has decided to focus on quality control and standardizing work processes." The transition project would therefore help "break silos to implement a more open approach between the different programs at the Institute. Although programs are too specialized to be fully integrated, there's a need to ensure greater standardization in work processes throughout the Institute."

The Content Management System

One particular effort to address standardization and, at the same time, better manage vast quantities of course materials consisted of implementing a Content Management System (CMS) in 2008. This involved installing an open-source software at the Institute, designed specifically to help users better manage important volumes of information. The Institute's CMS is therefore a multi-tier application consisting of a repository server, a publication layer and a database server. It is implemented as a networked application residing on a server and accessed remotely by users through networking software. It is intended for any organization needing a tool to better manage documents and other content, but is not designed specifically to meet educational or training needs. In other words, this is not the same as a Learning Management System (LMS) and it does not include the functionality needed to register students or manage their records, to manage instructional facilities or instructor assignments, or to teach courses at a

distance (the Institute recently negotiated an agreement with a local university to use their LMS for this purpose). Nor is it like a Learning Content Management System (LCMS) which stores learning materials and can save specialized information about learners. The CMS is used at the Institute in particular to create templates for lesson plans, share lesson plans between instructors and more efficiently update them over time.

My initial contact at the Institute described moving to the CMS as "looking at things like standardization of lesson plans [which brought up] the issue of how to develop courses" and led to implementing a competency-based approach to more clearly define instructor roles and responsibilities at the Institute. A competency-based approach is a human resource management model based on identifying the critical behaviors that are needed for effective personal and organizational performance. Using a competency-based approach allowed the Institute to better link key instructor job competencies with Institute courses, introducing accepted best industry practices for course development and lesson planning, and encouraged instructors to re-use content rather than re-creating it. Peter explained that:

> "[Some courses] have been taught for years and years, but every time [instructors] go to teach one, the material's gone or missing. You know, it's re-creation, re-creation, which is why we're using the content management system to avoid those issues."

This move towards standardization challenged long-standing practices. Until recently, individual departments at the Institute have managed their own instructional design processes and course instruction. So some see the standardization brought about by Larry's mandate, the Content Management System, and the instructor standards addressed in the course to be developed in this study as a loss of autonomy. Larry notes:

> "The problem I see, that I'm living with, is that those who already have a well established way of doing things that have a system in place, are scared to get involved for fear of losing what they already have. Interestingly, those who don't have much in place are more willing to participate."

Larry therefore saw two important advantages to this study, First, it introduced a methodology requiring participation and collaboration that directly supported emerging organizational values and could help build consensus on how best to prepare and lead highly effective instruction. Second, it could create the first in a series of courses intended to launch instructional standards at the Institute. Larry saw the course on instructional techniques to be developed through this study as "creating a [common understanding] of the competencies needed for teaching; it's about using this standardized training to accredit instructors."

He also saw this study as an opportunity for the Institute to increase collaboration among departments and more formally introduce the new CMS. Designing an instructional techniques course would also help promote standardization in courses and improve the quality of instruction.

ABOUT THE PROJECT

The project that was used for this study consisted of designing, developing and pilot testing a course on instructional techniques for new instructors at the Institute, and as refresher training for more experienced ones. The course would last eight days and be delivered in class using a face-to-face instructional format. It would take a practical rather than a theoretical approach to its subject and include as many opportunities as possible for students to practice using instructional techniques during short lessons presented to other course participants. It would also introduce new instructional procedures to be followed by all instructors at the Institute; after completing the course, participants would be able to interpret a standard lesson plan, follow it to teach a lesson and effectively use a given set of instructional techniques to create positive conditions for learning. The course would therefore focus on developing the skills needed to effectively lead classroom instruction and would not include other skills like those

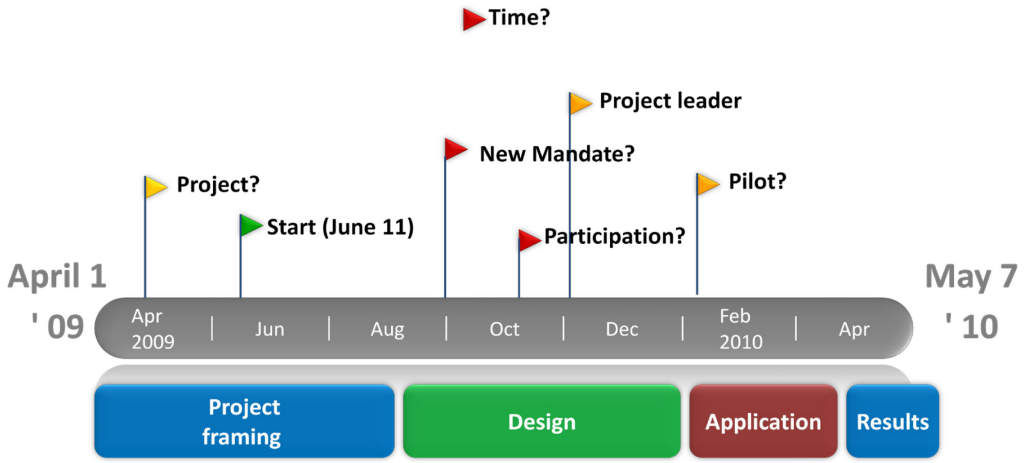
for instructional design or for measuring learner performance. These other skills would eventually be studied separately during other courses.

Executives at the Institute expected that a successful course would help standardize instructional practices there and improve the quality of instruction. As my initial contact at the Institute explained when we first discussed the study, "[Management] wants to make sure that whatever training is developed by any of the academic units [in the Agency] will be developed using consistent processes." Designing a course on instructional techniques would create common ground between all instructors at the Institute, regardless of their assigned department or program, by installing a common language to discuss instruction along with common instructional practices to teach them. It would establish using a competency-based approach to develop all courses offered at the Institute, and using a common tool, the CMS, to create and share course documentation. Management therefore expected that the instructional techniques course would help introduce new standards at the Institute that would be followed by all departments regardless of how they previously prepared for and delivered instruction.

The project took place over a period of about one year extending between April 2009 and May 2010. Figure 2 illustrates the project's evolution over time and identifies three issues of concern that could have prevented completing the

project as planned (yellow flags) along with three other issues that impacted the project (red flags). These events and issues are further discussed below.

Figure 2: Project Timeline



Clemenson *et al* (2007) and Watkins (2007)

ABOUT THE PARTICIPANTS IN THIS PROJECT

This was a team project that involved a number of participants. This section describes them. It first provides an overview of the categories of participants, and then describes in more detail the key participants in the study.

Categories of Participants

The participants came from the three groups of stakeholders on the project. Stakeholders were people who could influence the project and its outcomes, working either locally at the Institute or at the Agency.

In theory, stakeholders could include anyone who might influence the project, either because they were part of the target population for this course, had the authority to make decisions that would influence the project (for example, a manager responsible for project funding), or could indirectly impact or be impacted by the study (such as a union leader concerned about work agreements). In practice, however, senior managers became the primary stakeholders because they requested the project and clarified expected outcomes, decided on matters that could affect the organization, and ensured the project supported other important initiatives.

Larry, the Academic Director became the main stakeholder inasmuch as he represented senior management, was responsible for the academic program and for the quality of instruction, and was able to address team questions or other issues to be resolved during the project.

Other stakeholders included:

- Department Heads at the Institute. This management level consisted of supervisors reporting to Larry and overseeing the work of instructors and other employees offering a program or service. Although their numbers

have varied over time, there are typically less than ten employed concurrently at the Institute. They were responsible for overseeing the implementation of the new instructor standards introduced in the course, in their departments. They supervised instructors who would eventually take the course and become responsible for applying new instructional standards and techniques in their individual courses. Department heads, too, were expected to support the project by either assigning a department representative to the project team or supporting voluntary participation in the team by an instructor in their department. But not all department heads supported the project, some of them believing instead it would be better for the Institute's instructors to attend an existing instructional techniques course offered by a private company.

- Regional Managers and Instructors (that is, people who oversaw training activities for the Agency but worked in an office in one of the regions, outside of the Institute).

From the departments within the Institute came the key participants on the project. As explained by my initial contact at the Institute, "they are all subject matter experts in different topics. The common thread is they're all here to instruct." These key participants eventually formed two groups:

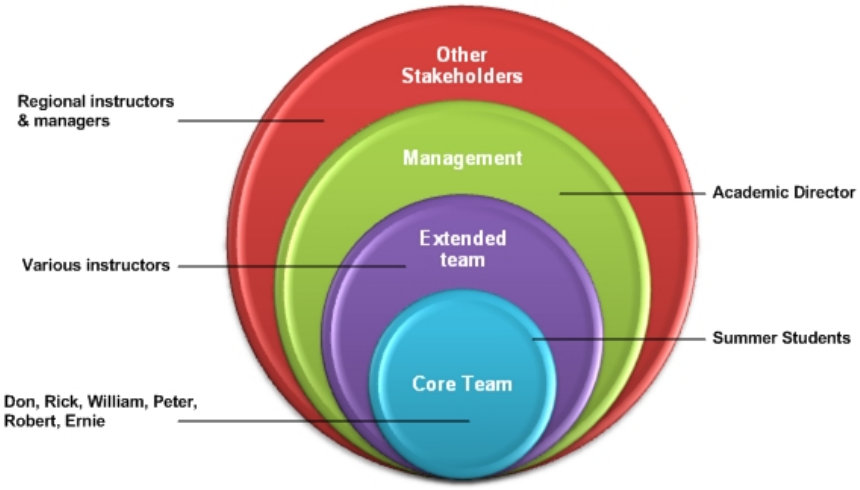
- A core team of people representing some of the departments within the Institute, who participated in all of the major activities of the project and

agreed to participate in this study. With the exception of Larry, the Academic Director, who represented the Institute's executive management, all study participants were members of the faculty in either the Academic or the Professional Development programs.

- An extended team of people representing other departments at the Institute (like the Department of Engineering or of Navigation), participated in some of the activities of the project and did not agree to participate in this study.

Figure 3 illustrates the arrangement of participants.

Figure 3: Study Participants and Stakeholders



Key Participants in this Study

This section describes the key participants in the project. Key participants in the study included core and extended team members. As noted in Chapter 3, core team members are central to the project and play a key role in all aspects of the course design and development. Extended team members are ones who played peripheral roles on the project and helped core team members by reviewing and commenting on the work.

Before introducing them, however, it is important to note that each participant played two key roles on this project. The first role was that of instructional designer. That is, a participant would act as a learning professional skilled in designing and developing courses that might be beneficial to others. .Although this was an important role for participants, it was not the primary role of interest in this study for two reasons. The first reason is that participants were not skilled instructional designers and therefore could not be expected to play this role well. The second reason is that because this study focuses on participatory design and because participatory design seeks to involve eventual learners in designing what they need, it was more important to study the role of participants as learners than studying their role as instructional designers.

The second role was therefore that of prospective learners for the course. As will be noted in this section, the instructors who participated on this project had limited training for their jobs. They learned most of what they knew on the

job. As a result, their instructional practices varied widely, their domain knowledge of instructional techniques was limited—and they were target students for the course. It is this role as possible learner for the course that is the primary interest of this study.

Core Team Members

Seven people served on the core team of the project. Core team members were those who agreed to participate in the study, volunteered for the project, regularly attended meetings, actively participated in team discussions and completed tasks assigned to them or for which they volunteered.

The first was Larry, the Academic Director introduced earlier in this chapter. As noted, he was the main stakeholder representing the Institute's executive team. He also oversaw the core team. As noted earlier, Larry was also relatively new at the Institute having started in his position less than two years before the study began. When describing his duties, he explained that "the position existed before, since 1979, under the same title although there were a few iterations of roles and responsibilities over time. But since 2008, [the organization] has decided to focus on quality control and standardizing work processes." Larry therefore spearheaded efforts to implement changes identified as part of what management considered a necessary transition process. To

introduce and implement change as quickly as possible he felt that he needed the trust and support of Department Heads and faculty.

Larry was already a well established manager within the Agency when he joined the Institute as the Academic Director. His career progression represented in many ways the typical career path that young recruits would be expected to follow after completing their studies in the Academic Program at the Institute. He graduated from the Institute and began his career in a junior leadership position in operations, and advanced to more senior positions in operations before joining the management team within the Agency's central administration. Larry did not have any formal training or education in instruction when he joined the Institute as the Academic Director.

The second core team member, Peter, was the project manager and responsible for:

- Organizing and managing day-to-day activities of the project, including scheduling team meetings, tracking the team's progress, reporting and working with management.
- Facilitating team work and ensuring active participation and interaction.
- Resolving problems as needed such as disruptive meetings or issues with individual behavior.
- Capturing and integrating the team's input into design documents and other learning materials for further review by the team.

- Preparing some of the learning materials.
- Arranging the pilot course and leading most of its course sessions.
- Reporting to management on the pilot course and recommending improvements.

Peter was the only formally trained instructional designer on the team and, as a result of that training, was familiar with common instructional design models. Because he was not familiar with the principles of participatory design, I introduced them as we worked together to set up the project and get started. He also helped me better understand the organizational context in terms of the Institute's history, mandate and structure; relationships between individuals and departments; and, the impact of changes being introduced. He agreed to lead the team as an opportunity to help achieve something important for the Institute while learning about participatory design. When I interviewed team members and asked them about the team and team dynamics, they were all quick to underline how important Peter was to the project.

Peter had already worked for the Agency for more than twenty years when this project got underway. After starting his career as a seaman, he became interested in aviation where he first earned a pilot's license and then became a flight instructor. Circumstances then led him to join the Agency where he was trained for an operational position involving managing the flow of traffic in defined areas. After working in this position for a few years, he joined the

Institute as an instructor in traffic management, in the Professional Development program. Because he already had a Bachelor's Degree and a personal interest in training and education, he decided to pursue a Masters in Education, in Information Technology. Peter described this degree as "applying the learning methodologies to [IT] infrastructure that you would use, either in house… or by distance. [It involves] things like using emerging social software in the classroom… prototyping and evaluating educational IT solutions." When this project started, Peter's responsibilities were again shifting from being primarily an instructor to becoming more a project manager, working with Larry, the Academic Director, to help with the transformation project at the Institute.

During his career, Peter acquired substantial experience teaching adults in a work related environment, either as a flight instructor or as an instructor at the Institute in the Professional Development program. This did not include, however, formally learning about instructional design until after he started his Masters in Education. Peter explained that when he first started teaching he would plan his lessons based on what seemed the most logical or effective way to introduce content or develop skills. He learned about different instructional design models while completing his Masters degree, about ADDIE in particular and about using rapid prototyping to more quickly trial a course or lesson and get feedback for improvement. He felt very comfortable with both the concept and practice of rapid prototyping because it reflected his personal experience working in

instructional design and because he believed in the importance of getting feedback early in the instructional design process to improve outcomes.

Rapid prototyping involves quickly building a model or representation of something being designed for evaluation and adjustment purposes. First introduced to improve software design, rapid prototyping has since become an accepted design methodology in other fields, including in learning and instruction. In instructional design, rapid prototyping "involves the development of a working model of an instructional product that is used early in a project to assist in the analysis, design, development, and evaluation of an instructional innovation" (Jones and Richey, 2000).

Rapid prototyping therefore allows learning from situations rather than relying on planning to accurately specify all that will be part of a design, and then on the ability to faithfully execute what was planned. Trying and adjusting prototypes with potential learners is also a "crucial part of the prototyping process" (Tripp and Bichelmeyer, 1990). Because it relies on involving actual learners in an iterative process of creating, evaluating and adjusting prototypes, rapid prototyping reflects similar concepts as those of participatory design.

The rest of the core team members were expected to be actively involved in all phases of the instructional design process, in line with the principles of participatory design. This involved:

- Attending all meetings (or as many as possible).

- Actively contributing to discussions by sharing information, contributing ideas, listening to and discussing the ideas of others, suggesting content for learning activities, discussing how activities should be organized and carried out, and providing other input as needed.
- Reviewing learning materials and making suggestions to improve them.
- Helping to determine learning outcomes and the standards to be maintained.
- Completing assignments as needed, like getting input from others not directly participating in the project.

Besides Peter, the core team included three instructors from the Professional Development program and two from the Academic Program, including:

- Dan, who worked as a science instructor in the Academic Program and is permanently assigned to the Institute. Dan joined the Institute two years before the study began, immediately after earning a doctoral degree in Physics. His previous work experience consisted mostly of teaching physics at the university where he completed his PhD.
- Ernie, who taught emergency management in the Professional Development program and is permanently assigned to the Institute. Ernie joined the Institute less than a year before the study began, after working for five years in a similar position as Peter, the project manager, in traffic

management. Before joining the Agency, Ernie first earned a Bachelor's degree in marine biology and a Masters degree in environmental emergency management. Ernie's duties before joining the Institute included doing some on-the-job instruction, but he did not formally study instruction or instructional design. Instead, he completed a short course on instructional skills at the Institute, instructed by a private consultant, just before joining the Institute that he did not consider useful.

- Robert, who taught small vessel management and search and rescue techniques for the Professional Development program and is permanently assigned to the Institute. He had over 20 years of experience with the Agency, having worked as a team leader during search and rescue operations. He joined the Institute about three years before this study and quickly became a team leader and course supervisor. He did not have a formal university education but worked his way up the ranks instead to first become an operational team leader and then an instructor and supervisor at the Institute.
- William, who also taught courses for the Professional Development program and was temporarily assigned to the Institute during the period of the study. Like Robert, William had more than 20 years of experience with the Agency, having worked as an emergency response team leader before joining the Institute. He joined the Institute about six months before the

study began while recovering from a work-related accident and preparing for a new position. William had started but not completed a Bachelor's degree, had joined the Agency instead and worked his way up through the ranks to a leadership position. He is the least experienced instructor on the core team. William admitted he was initially intimidated by the idea of instructing, but took to it well. He saw a real challenge in contributing to a team effort to design a course and remained keenly aware of his own limited background in instruction and instructional design, relying on other team members to help him understand concepts and even in some cases the terminology used. In his words, "A lot of it's over my head. Some days I need a life jacket to keep my head up I think!". At several points during the project, William commented how much he was learning from participating in the project.

- Rick, another science instructor in the Academic Program who is permanently assigned to the Institute. After earning a Bachelor's degree in Mechanical Engineering, Rick taught at the Institute and elsewhere as a contract instructor, including teaching for eight years at a local university. Rick enjoyed working at the Institute and was glad to become a full time instructor two years before this project began. "I love it here" he explained, noting the greater camaraderie that existed at the Institute compared to where he had worked before.

As suggested in the descriptions in the individual members, the core team's experience and expertise in education, instruction and instructional design was limited, except for that of Peter, the only team member with formal education in instruction and instructional design. He understood what instructional design involves and how to go about it. However, he was not familiar with participatory design and tended to rely on ADDIE as his 'fall back' model for instructional design.

Dan, Robert and Ernie had each previously completed an instructional techniques courses offered by consultants at the Institute. These courses primarily focused on the ability to instruct courses rather than design them. They introduced instruction in the workplace and taught how to prepare for and lead instruction in a classroom setting. Dan and Robert had completed the same course together while Ernie completed it a year later. As a result, the three came away with different perspectives on the value of their training: Dan and Robert considered they had completed a very interesting and worthwhile course while Ernie regretted that the course he attended was too theoretical and did not provide enough practice on using instructional techniques. Neither William nor Rick had yet been able to take this type of course although both were eager to do so.

In addition, two summer students worked with the core team during their stay at the Institute, but because they only participated for a short period of time early in the project, were not regular staff members with the Agency or at the

Institute and missed much of the design process, they are not included in the core team. They nevertheless made important contributions by assisting with setting up the Content Management System and with researching content. As Peter observed, "Well, they were valuable, there's no two ways about that!"

Extended Team Members

In addition to the core team, the project team included an extended team. Members of the extended team participated in parts of the project, but not in all of it. Their participation varied throughout the project depending on their workloads and general availability. At times these people made comments and suggestions that directly contributed to team discussions.

Extended team members came from two groups. The first is representatives from departments whose department heads did not fully support the project. It included five instructors from the Professional Development program. The second group of extended team members included instructors and managers working for the Agency, but outside the Institute. These people worked in the field - in other locations in Canada. After hearing about the project, many of these instructors and managers sent e-mail messages and other types of communication to Larry, Peter and other core team members to express interest in the project and a desire to take the course. Peter, for example, received so many inquiries early on about the course that he declared that "the demand for that is

going off the charts!" In the end, however, these instructors and their managers were not vocal about the project, did not participate in the study and therefore had little influence on the course design.

Table 4 provides a summary of the various participants in this project.

Table 4: Study Participants and Stakeholders

Category	Participants	Characteristics
Stakeholders	Academic Director	A senior manager with a long standing career with the Agency. Recruited for a specific mandate to implement a transition process leading to academic and operational improvements.
	Institute departments	Department heads were important stakeholders because their instructors were part of the course target population.
	Regional instructors and training managers.	Agency staff working in regions in positions involving training or managing training activities.
Core team members	Peter (Professional Development program)	A senior instructor at the Institute with more than twenty years experience with the Agency, and amongst the few with a formal degree in education (M.A. in Education, Information Technology). Peter became the project manager and team leader early in the project.
	Robert (Professional Development program)	A senior Agency employee with more than twenty years of experience leading teams in the field, Robert joined the Institute as an instructor in professional development a few years before this project. He had no formal background in education, instruction or instructional design.
	William (Professional Development program)	William was another senior employee with extensive operational leadership experience. William only had a limited background in education, instruction and instructional design, and was at first concerned that this would prevent him from contributing effectively to the team.

Category	Participants	Characteristics
	Ernie (Professional Development program)	Ernie was a new instructor at the Institute and an eager project participant, recognizing it as an important learning opportunity. Ernie possessed a master's degree in emergency management but had no formal background in education, instruction or in instructional design.
	Dan (Academic Program)	Like Ernie, Dan was a recent addition to the Institute's faculty. Dan held a Doctoral degree in Physics but had only limited instructional experience with no formal background in education or instructional design.
	Rick (Academic Program)	A more experienced instructor both at the Institute and in other organizations, Rick first joined the Institute as a temporary instructor, taught elsewhere and then returned to accept a permanent position at the Institute a few years before this project. He had also earned a degree in science but lacked formal background in education, instruction or instructional design.
Extended team members	Five Institute instructors	Extended team members were Institute Instructors working in one or another department of the Professional Development program. Members of this team did not participate regularly in project activities.

THE PROCESS FOR DESIGNING THE COURSE

With a background on the organizational context and participants in the study now in place, this part of Chapter 4 describes the sequence of events that comprised the development process for the course. It describes this process in terms of the four phases of participatory design identified in the models proposed

by Clemenson *et al* (2007) and Watkins (2007) illustrated in Figure 4, and that was used at the start of the project to answer their questions about what could happen during a participatory design project. The first two sections describe the first two phases of the process (Project Framing and Design). The third section provides a combined discussion of Phases 3 and 4. Each section first describes the purpose of the phase, then describes key activities that occurred during the phase.

Figure 4: Phases of the Participatory Design Process (Based on Clemenson and Watkins)

About The Initial Participatory Design Model

At the start of this study and while preparing to identify a research site, I became aware that potential participants might have many questions about participatory design and using it in this project. As an experienced instructional designer and project manager, I expected in particular to be asked about steps to follow and activities to complete. Because I wanted to focus on participatory design, I returned to the literature and looked for a model I could share with

potential participants and provide some direction to get started. Finding an existing model was also important because I did not then know what model of participatory design might emerge from this study that I could propose. I therefore selected an existing model to provide basic guidance on using participatory design to which team members could refer to as needed.

During this review of the literature, I found three important reasons to use the model proposed by Clemenson and Watkins. The first reason is that the model does include some steps arranged in a structure or sequence that I expected would reassure some organizations and individual participants. The second reason is that it only included a few steps that are easy understood by non-experts in instructional design or in participatory design. The third reason is that the model is sufficiently different – in terms of steps and the terminology used to identify them - from existing models of instructional design not be confused with an ADDIE-like model.

I decided to include this model in the two documents I prepared to explain the study: the one for organizations (the call for participation) and the one for individual participants. I found out later during interviews that the documents were generally useful and that they helped some of the participants confirm their interest in the project. When I first interviewed them, I confirmed that each participant had read the document and understood its content and the model presented. They all reported that this was the case and that the documents had

helped them better understand what was being proposed. Ernie, for example, confirmed he was glad to see that the project was structured in steps and that this helped him better understand how team members would work together over time.

I did not, however, discuss the model with participants after the study was started nor did I encourage its use in any way. I carefully avoided doing so because I did not want to influence the team's decisions on how to design their course. I wanted instead to observe and document how they would decide together how best to design their course.

Phase 1: Project Framing

Phase 1 is project framing which involves clarifying and confirming the mandate for a project, and preparing for the rest of it. In this project, project framing specifically involved:

- Confirming the goals of the project and expected outcomes. This involved confirming that the project would be about designing an instructional techniques course for the instructors at the Institute. It also confirmed what should be included in the course. For example, executives at the Institute agreed that this course would primarily focus on instructional skills and would only briefly introduce instructional design.
- Preparing a plan for proceeding with the project that included setting milestones and deadlines.

This phase was initiated by Peter, the project manager. Key participants included Peter, Larry – the Academic Director – and Robert - a member of the core team who helped Peter decide if this project should focus on designing a new course for instructors, or continue improving an existing course for operational staff.

Project framing primarily occurred during the spring and early summer months of 2009 and took about one third the total time needed for the project. It included two main activities: getting started and carrying out a DACUM. The first activity to get started included recruiting participants and providing them with the tools and information needed to start designing the course. This first activity is typical of most projects and was planned. The second activity was not planned but occurred instead when the core team decided that doing a DACUM would best help them confirm the job duties and responsibilities of an instructor at the Institute and design a course to help perform them effectively and efficiently.

Getting Started

I received the Institute's signed consent form to participate in my study on April 1, 2009. Peter, who was now the official project manager, started recruiting participants – the first task in framing the project. As noted earlier, participants would be recruited to assume two roles, that of instructional designer and that of

prospective learner although my research focused mainly on the role of prospective learner.

To recruit participants, Peter sent a general email message to all department heads explaining the project and inviting the participation of their staff. For those who expressed interest, he also prepared a follow-up document that outlined the project and anticipated level of effort, and that asked department heads of the prospective participants to allot work time to complete project activities.

Apparently, when he recruited participants for this project, Peter was already concerned about how the organizational culture might affect the participatory design process. During our second interview, Peter explained that he hoped to recruit instructors at the Institute who were familiar with the organizational culture and understood its effects on instructors. As he explained, "My personal desire had nothing to do with the person's background in instructional design. It was more about their understanding some of the cultural needs our kind of instruction demand." In the end, six instructors volunteered to participate in the project, including three with more than ten years experience working for the Agency and at the Institute, and three others with less than ten years experience in this environment. As the project unfolded, Peter took steps to discuss cultural issues directly with the team. For example, he invited a psychologist on temporary assignment at the Institute to meet with the team and

discuss how various aspects of the organizational culture and the nature of its operations affected the work of instructors there.

Peter had also already shared some concern about ensuring participants would be available to complete the project, stating in our first meeting "I want to make sure the resources are going to be available for all the duration." In a later email message to other team members, he further explained that,

> "To make sure we didn't have any difficulties in [getting time to work on the project], I authored a proposal document for all the department heads who have bought into this and are supplying [participants]. But [I] even went higher up the chain of command to ensure that the people who will be assigned to the project are given time to do it."

Events soon underlined his concerns. Shortly after getting started, I learned that the project was temporarily stopped to take care of "some things that must be done at our end to assure the kind of success we need". Apparently, Peter felt that he had misread the actual intentions of department heads when stating that they had already "bought into this". I learned later during our discussions that one department head not involved in this study had reacted strongly against the project, partly because he believed it would be led by someone at the Institute he did not appreciate (there was a serious conflict between this individual and another one thought to be part of the team). But other concerns existed. The same individual was also concerned about the need for a custom-designed course. He

believed that existing, commercially available courses would meet the needs of the instructors at the Institute well enough that the time and effort needed to design a new course could not be justified. Two other department heads were concerned that they did not have enough staff on hand to assign someone to the project and still be able to meet other deadlines and priorities. Peter explained that "while senior management supported the project, middle management balked and needed additional convincing". It would take six weeks to resolve these issues and for Peter to handle other priorities not linked to the project but to other job duties instead, before resuming the project. In his comments about this event during subsequent interviews, Peter suggested that other reasons may also have motivated his reaction but did not share any other detail.

One early concern on the project was finding time to participate. Participants at the first team meeting were already concerned about the project timelines and their availability to meet and work together, asking for example, "how are we going to proceed when it is difficult to get all of the team together?" Or as Dan summarized it in one of our interviews, "we are having a heck of a time getting the group together!" Rick, who was perhaps the member of the core team that was most concerned about finding time to participate regularly in the project, explained during our first interview that his workload would increase again in the fall once the academic semester got underway and that it could become difficult for him to participate regularly:

> "See, my only concern at this point would be [that] during the summer my course load is fairly light. Now come September, it's fairly heavy . [If the project takes] an hour of two of your time each week then that's fine, you know that can be worked around my classes and schedule. But if it gets heavier than that then it might be a little bit more difficult to contribute more than that to the project, once September comes around."

The issue was raised with, and acknowledged by management, but not directly addressed because of staff shortages. Participants therefore had to work around time constraints as best they could. Partly in reaction to this, they agreed to meet weekly on Friday mornings even if some of them could not attend. Meetings usually lasted two hours but meeting duration often had to be adjusted to accommodate individual schedules. In one case, for example, Peter requested that a meeting start earlier and end sooner than usual to allow three participants to attend to other duties: "We have a meeting room for 08:30AM tomorrow (Friday). Early is important because Ernie must depart at 10AM to catch his flight home... William and Robert will probably need to depart at 10AM also due to other commitments".

After starting to schedule meetings on Friday, core team members were better able to anticipate and address scheduling conflicts, but could never fully resolve them.

Finding the time to participate remained an important issue for team members throughout the project but was most pronounced for extended team members. However, not every member of the core team was convinced that busy schedules fully explained why some members of the extended team could not participate more often. William expressed his concern by saying,

> "I really don't feel comfortable about those other folks not being here. They don't support some of the things that we're moving ahead on, they don't support [the CMS], they're not open to much change in how we train instructors. They're not open to… a lot of change there… And because of that we're going to end up forcing something on them."

Rick commented that,

> "It seems to be going well for us. I don't know if it could be better because I think we're still missing a few members from other [departments]… You know when it comes time to actually do it, [it helps] when people are willing to do it, but like I said I don't think we have a 100% participation from all different departments, so… It's not like we haven't offered."

When new participants – who eventually became members of the extended team - joined the project, Peter explained that,

> "We have just taken on a couple of people, or actually opponents of the [project]. They're dead-set against us doing this. And the reasons for being dead-set against this, and my own personal belief, is that they just don't

understand what it is we're doing. And I think they will be won over in time, but not until they get a chance to see the proof."

Robert added "it's really not so much to do with the actual course development but with some of the people that are coming who are resistant to change." For his part, Ernie felt that many instructors at the Institute did not believe in the project and were more influenced by "personality conflicts" between individuals than by the project work.

These issues seemed to be rooted in the earlier concern: whether this course was actually needed. However, this difference in belief about the need for the course could also be rooted in the history of the Institute. As Peter, William and Robert explained during their interviews, the Institute seemed to have suffered from a type of management neglect for many years until Larry's arrival. For various reasons, including convincing people to relocate nearer the Institute, it had been difficult to recruit executives willing to accept longer term positions and stay at the Institute. Peter, William and Robert felt that staff at the Institute had therefore witnessed what some considered a procession of senior managers that came and went without significantly impacting the people and events there. Some departments reacted to these management problems by creating and following their own work processes, procedures and standards that worked well enough to provide their faculty with consistent direction. These departments were now confronted with two fundamental changes: first, having to report to an Academic

Director intent on fully assuming the responsibilities of his position and providing leadership; and second, they would lose some of their autonomy and ability to decide themselves how best to go about their business.

Comments from members of the extended team heard during one meeting and that were confirmed by all core team members during their interviews indicated that some departments were convinced it would be better to send instructors away to take a commercially available version of an instructional techniques course rather than developing one internally, even if not tailored to meet the needs of the instructors at the Institute. During previous years, some departments had sent their instructors to a 3-day instructional techniques course for new instructors offered by a company advertising itself as the "World's largest Train-the-Trainer company". Although the course seems to have satisfied the needs of members of the extended team, the core team felt differently. Peter and Robert, who knew this course, did not believe it was sufficiently detailed and oriented towards the type of instruction offered at the Institute to be useful. Rick and Dan were especially concerned that this 3-day course would not sufficiently address the needs of instructors in the Academic program. Ernie, who had completed a similar course that he did not consider useful a year earlier was concerned that purchasing a course would lead to similar results. William, who had not completed an instructional techniques course before this project, relied on

the advice of his colleagues and agreed that developing a course for the Institute was the best option.

The data gathered during this study suggests that two main reasons motivated the decision to design the course internally. The first reason was to meet the specific needs of instructors at the Institute and within the Agency. As Peter explained it, they had to be "sure that we put [an Agency] spin on things and not just because we want to make it [that way] but because we have particular needs to be met". Robert, however, may have explained it best:

> "[We've had] a lot of very good discussion as to our own particular needs and that's important because we're an unusual organization and, you know, not all of our training is done in the classroom, sometimes it's done on the water, or in the water, on the shoreline or just about anywhere on a ship, you know. So we really have to take all those things into consideration and we also have a lot of skill training that takes place. So, and a lot of safety issues."

Larry agreed with the core team's assessment of how useful an 'off-the-shelf' course could be and supported the idea of developing a course specifically for the Institute.

The second reason involved overcoming the tendency of departments to work in silos and increasing team work. From the start of the project, Larry saw in participatory design an opportunity to improve collaboration between departments

and reduce their tendency to work alone. Core team members were well aware of this objective, and of how difficult it was to achieve. As William explained:,

> "I think Larry did his best to try and encourage all the departments to participate and they just refused. I think that this is… one of the crosses he has to carry as the Academic Director. He's trying to bring everybody together and get everybody working together as a team. And that… that is probably one of the hardest parts of this job, to get everybody at the Institute to work as a team."

As stated above, the difference of opinion between core and extended team members on the type of course to use for instructor training at the Institute became clear during a regular weekly team meeting I attended. At that meeting, a member of the extended team who had just joined the project argued strongly that the needs of instructors at the Institute were not so different from those of instructors elsewhere to justify the time and effort needed to design a course specifically for the Institute. In his argument, he rejected one of the basic reasons for tailoring a course for the Institute: that it should not only teach proven instructional techniques but that it should also introduce and establish new instructional standards for all instructors at the Institute. Core team members explained this reaction in different ways ranging from not spending enough time working on the project to understand what they were trying to achieve, to wanting to attend courses away from the Institute for personal reasons. In the end, a

supervisor had to intervene in the meeting and make it clear to everyone there that work would continue as planned regardless of this objection.

As an observer, I found this meeting unsettling for two reasons. First, the member of the extended team who argued against tailoring a course for the Institute was confrontational at times which made the conversation difficult. Listening to the conversation made me better understand how difficult and frustrating it likely was for core team members to handle these objections, and I wondered how that might affect their motivation to continue. I was also concerned that the extended team might prevail and that their objections would derail the project. These concerns did not materialize and core team members did eventually complete the project as planned.

Using a DACUM

With these initial issues temporarily resolved, the project was able to truly get underway. Beyond being project manager, Peter also soon became the true team leader. He was the project catalyst, a firm believer in the value of participatory design and how it could help address some problems at the Institute, a key contributor to team discussions and an effective project manager. In our first interview after the initial delay, we discussed how best to get the team started on designing the course. He confirmed understanding and being comfortable with the four general phases of participatory design presented above and that I had shared

with him when we first discussed the Institute's interest in being my research site. We then agreed to use the first team meeting to review project objectives, expected outcomes and timelines, identify upcoming tasks and how to tackle them. I declined to lead that meeting preferring instead to let him work directly with the team as much as possible. Once again, I declined to lead the meeting because I did not want to create the impression I would lead the team or that team members should rely on me for direction. I wanted instead to let Peter establish himself as the team leader on his own and let the team to decide together how to proceed.

In that interview, Peter also proposed getting the team started with a DACUM (Developing a Curriculum). DACUM is a method to develop an occupational analysis. In a DACUM, a group of expert workers from an occupation of interest work together as a panel to define what the worker does in terms of duties and related tasks. As stated on The Ohio State University's website for its Center on Education and Development for Employment (retrieved in 2011),

> "The Panel works under the guidance of a trained facilitator to develop the DACUM Research Chart. The chart contains a list of general areas of competence called *DUTIES* and the *TASKS* that define that duty. Brainstorming techniques are used to obtain the collective expertise and consensus of the Panel. As the Panel determines each task, it is written on

> a card. The cards are attached to the wall in front of the Panel. The completed chart is a graphic profile of the duties and tasks performed by successful workers in the occupation."

Because each member of the core team was an instructor at the Institute, Peter felt they could be the experts who would map together the occupational duties and tasks of an instructor and extract from them the knowledge and skills to be covered in the instructional techniques course. However, because of delays getting started Peter became concerned that completing a DACUM would take too much time and could prevent the team from having the course ready by its year-end deadline.

In an email to the team shortly after this interview to set up the first team meeting he proposed starting instead with listing potentially relevant course content, explaining that,

> "Given the much shorter time frame [to design the course], I would like to forgo the completion of a full DACUM. Instead I would like to offer a 'suggested' curriculum list and have the team analyze this list and make suggestions for additions or deletions. I believe this will save us some time in getting started."

Starting by inventorying content also reflected a personal preference to some extent. As he explained in an interview,

> "My personal way of doing things and the way I have worked that's been very successful is like creating a shotgun approach to content on a very specific topic: capture everything and then sit down as a group, even if the group only consists of two people and proceeding from there [to sift through and identify relevant content]."

When Peter first talked about foregoing doing a DACUM, I became concerned that starting discussions about content too quickly would prevent team members from investigating their needs and confirming what would best help them become better instructors. My reaction directly reflected my experience leading instructional design projects for the workplace that often underscored the importance of starting design by confirming learning needs and how best to meet them before discussing content. However, I did not discuss my concern with Peter during this interview or later because I did not want to interfere with the team's design decisions. I wanted instead to let them determine how to approach designing this course and select the activities they felt would best help them achieve their goal.

Our discussions also revealed that Peter was having some trouble finding a middle ground between providing the team with necessary leadership and being what he thought was too directive. While serious about managing the project effectively, he clearly understood the value of equal participation to design the course and wanted to be entirely open and inclusive: "I like the group work and it

doesn't work if you don't have… not just buy-in but more than buy-in: it has to be engagement. I don't like giving my input to a team. I only... it becomes an issue because of the timeline."

He sought my opinion about how best to deal with this dilemma and after reviewing options together we agreed to first get the team involved in a discussion about instructional design and how to design this course before inventorying content. To facilitate that discussion and at the team's request, I led a session on instructional design with them during which I reviewed what instructional design is and the typical tasks to be completed. At the same time, I did not refer to any particular instructional design model to explain these tasks and tried to avoid established terminology like analysis, design, development, implementation or evaluation in order not to create the impression that instructional design consists essentially of following a [generic] model like ADDIE. I referred instead to tasks like understanding the problem at hand and how learning could help solve it, selecting instructional methods and learning activities, and confirming results. At the end of this meeting, the team agreed to first identify key instructor competencies from the literature, review them and select those more relevant to the work of instructors at the Institute's, and then use them to further identify and validate the course content. They next proceeded to gather information on instructor competencies from reputable sources like the International Board of Standards for Training, Performance and Instruction. They also reviewed work

that had been done previously at the Institute on instructor competencies to take advantage of what might be useful there. Generally, however, the team relied on lists of published competencies from reputable organizations.

At a meeting soon after (which I attended remotely via teleconference), the team started reviewing the competencies identified in the literature but found itself struggling to make sense of this information. After some discussion, Peter acknowledged that "we're almost down to... yellow sticky notes" – a reference to a recent DACUM done at the Institute in which Peter, William and Robert worked with colleagues from various regions to develop a DACUM chart for their occupations. Robert and William quickly agreed with Peter's suggestion and other team members willingly followed their lead so that within a few minutes supplies were found and work was underway to identify instructor duties and tasks, write each one on a yellow sticky note and post it on a wall in the meeting room. This work continued and was completed over a series of team meetings during the remaining summer weeks.

After deciding to do a DACUM, the process the team followed to complete this exercise illustrates well how team members worked together during the design phase of this project. Team members prepared individually for the DACUM meetings by reviewing, selecting and arranging those instructor competencies they believed best reflected their duties at the Institute for discussion with other team members. Peter contributed his own version of these

competencies but so did other team members. After reviewing all contributions, the team decided to rely more on Dan's work to guide their discussions because it was more complete and well structured that were other contributions. During the rest of the project, the team mostly followed this pattern of preparing and sharing what was prepared before identifying key ideas or concepts to reflect in the course design.

The team reviewed the instructor competencies they had identified individually by discussing together how well each competency reflected their instructional experience. For example, when discussing the difference between instructing and facilitating, Peter and Robert made these comments:

> [Peter] "I learned something this weekend that I was a little surprised at. I assumed that if you were a really good instructor from the point of view of leading an interactive class, you would automatically be a good facilitator. That's not the case! Different skills."
>
> [Robert] "You must have been in my class last week because I was supposed to be facilitating there but I can't keep my mouth shut as I should right? I have a real problem with that."

During another part of the conversation, team members entered into a discussion on communication skills and their use in the classroom. Peter, Robert, Ernie and Dan all actively participated in this conversation (William had to leave the meeting early to attend to other duties and Rick could not attend), first

clarifying what it meant to communicate effectively in the classroom and then how best to develop practical communication skills during the course they were designing.

The conversation focused on the experience of being an instructor at the College and elsewhere in the Agency. During one conversation, for example, Robert reminded the team of cultural issues to be addressed:

> "You know, we have a very diverse group of people that we're teaching and I mean we have our own culture here. We're dealing with the younger students that we literally capture here, and then we have people all over the country. Some people haven't been in training for years. What may apply very well to something here in the classroom doesn't work when you're [teaching] in Nunavik. It's a whole different situation there."

In some ways, I was relieved by this turn of events and that the team decided to complete a DACUM. As previously discussed, when Peter first suggested to other team members that they might not have time to do a DACUM, I became concerned that if the team skipped this activity (or another similar one) it might not identify its learning needs well enough to reflect them in its design decisions. In the end, the team did address my concern and identified its learning needs. But perhaps more importantly, this episode reminded me of the importance of letting the team work through design issues on its own without my interfering.

The pattern of discussion that the team followed during the DACUM eventually evolved into a five-step cycle the team followed consistently during their work:

1. Select which competencies to review next.
2. Individually review them in preparation for the next team meeting.
3. Meet and discuss competencies together and decide how to address them in the course.
4. Document decisions in the course management system.
5. Validate and confirm the information before continuing.

Peter later commented that this unfolding of events was "eye opening to me, because the way I've always done it (selecting content) was the [Institute's] way and not necessarily the right way – actually I'd say it's not the right way". After further reflection he added,

> "The other thing that struck me and it struck quite [hard] was looking at competencies first, and signing off on those. That's something I'd never done before. Because I hadn't incorporated that line of thinking in my processes, I completely overlooked the value of the DACUM and thought we could survive without it, but... It was almost an instantaneous decision [by the team to use a DACUM to help organize our thinking]."

Peter was also thankful that Dan had been well prepared for the meeting and willing to lead it for a while. As he explained in an interview shortly after the DACUM meeting,

> "I like the group work and it doesn't work if you don't have… not just buy-in but engagement. I don't like giving my input to a team. I only... it becomes an issue because of the timeline. That's why I keep saying I'd rather not talk and let them do the talking. That's why I was so thankful that David had that work and he started giving input."

In many ways, this episode set the tone for how the team would work together during the remaining months of the project. Typically, Peter would be the member of the team who scheduled meetings, consolidated team input, updated documents in the CMS and made sure other team members were kept up to date. Other team members, however, also shared these responsibilities. Dan, for example, took on the responsibility for scheduling team meetings when Peter was temporarily away on leave, and Ernie became an expert resource on organizing information in the CMS. Team members remained responsible for individually preparing for meetings, researching content as needed, discussing issues about building the course and making appropriate decisions. The team consistently worked together to identify and resolve problems, decide which actions to take and how to create a course that would meet their needs.

During this first phase of the project, core team members developed a strong appreciation for working together and being included in a participatory design process. Dan, for example, appreciated how well core team members collaborated: "we happen to have a really good group, there's no resistance in this group, we're all open to discussion, it's always just round table discussions, nobody officially takes charge or anything like that". William added

> "I think it's very positive. I think that everyone benefits from the team approach. I see a real advantage to that. Things come up all the time that just wouldn't present themselves with one or two people working on it."

Phase 1 of the project that took place between April and August 2009 was therefore characterized by working through initial organizational issues, recruiting team members and taking first steps to design the course. At the end of this phase, core team members developed a list of instructor competencies they could use to determine what to include or exclude from an instructional techniques course tailored to meet their needs and those of fellow instructors at the Institute.

During this phase, the core team also became a cohesive unit in which team members worked well together either one-on-one or as a group. Peter assumed the role of team leader more often than others but did not impose his will on the team. Instead, all team members shared the workload as needed and remained responsible for actively participating in and contributing to the project.

Team members appreciated being able to participate in the process of creating a course they could eventually attend.

Phase 2: Design

With the project properly framed, the design phase of this project could begin. Design involved all activities needed to produce the course.

This phase was initiated by the core team members together who agreed they had the information needed to start designing the course. Key participants included all core team members, Larry, the Academic Director, and other Institute instructors who did not participate or contribute regularly to the project and are therefore part of the extended team. The goal of this phase was to finish designing the course, develop necessary instructional materials and make the course ready for delivery. Completing this phase also required removing obstacles that surfaced along the way. The expected outcome of this phase was having the course ready for Larry to review and approve before pilot testing it.

Design occurred between September and December 2009, approximately one-third of the time used to complete the project. It was characterized by regular design sessions (meetings) during which participants worked together to create the course. It was also the most demanding phase of the project, both in terms of work completed and handling obstacles.

Completing the Course Design

September at the Institute marks the start of a new semester, the return of students in the Academic Program from summer assignments and a similar resurgence of activity in the Professional Development program. For team members, September meant getting back to regular duties and handling a demanding schedule of preparing and teaching, and finding time for projects.

By September, the team was well established in its Friday-morning-meeting routine that allowed it to make regular progress designing the course. Core team membership remained stable at six participants that were motivated and worked well together. In William's words, "the people that are there want to be there. They share a common goal and they like working together." At the same time, participation in the extended team remained variable and reflected fundamentally different opinions that existed between departments on how best to train instructors and which instructional standards to follow. These differences of opinion and the resulting behavior of some members of the extended team remained a source of concern for core team members throughout the project.

In an email to the team in early September, Peter summarized the work done to date as having,

- Reviewed and confirmed the instructor competencies to be addressed in the course.

- Discussed the duration of the course and how to allocate the total time available between the different sections of the course.
- Identified areas requiring management sign-off.
- Identified some content best delivered by guest instructors "to keep the course interesting and promote knowledge transfer".

During this phase, team discussions focused on understanding their role as instructors at the Institute and what they should learn from a course on instructional techniques to improve their skills as instructors. Team members continually referred to their experience as instructors, and to what they had observed in other instructors at the Institute, to decide whether or not a topic or learning activity was appropriate for the course. They challenged each other to explain why a topic or activity should be included in the course and commented often about what would make a topic or activity relevant to them.

The events that took place during the second team meeting I attended via teleconference illustrate well how core team members worked together during this phase to design their course on instructional techniques.

Peter, who had arranged the meeting, started by reminding the team of its purpose: "ratifying what we're going to have as our list of competencies to build our course around". All core team members were present, except for Robert who had to attend to other duties. The team had already started reviewing and discussing various instructor competencies to confirm which to include in their

course. Peter, who had entered the results of these discussions into the CMS, printed and shared copies of the information to make it easier for other team members to keep building on this material.

The meeting therefore represented another step in the iterative cycle the team adopted to gradually define, review and adjust their work. Four times during the meeting, team members reminded each other that they could return later and review their decisions again before finalizing the course design. In Peter's words, "We all know we can come back to these later if we find we've made a mistake. That's the beauty of the way we do things."

The meeting was characterized by an open dialogue that flowed well, involved all team members and was without arguments or difficult discussions. Each team member participated and offered opinions about the meaning of competencies and how well they reflected who they were as instructors. They often referred to their own experience to explain their understanding of a competency. For example, when discussing the instructor competency "use appropriate technology", Dan explained how he might use different tools or technology: "Like say if I'm talking to an audience and I need a microphone, well that's recognizing that I need a microphone", Later in the meeting, the team was discussing the meaning of a competency involving managing classroom dynamics and Peter summarized that discussion by explaining it involved "the dynamics between you and your class".

During their discussion, the team remained very much aware of the need to confirm their design decisions about what to include in the course with other instructors and with Larry, the Academic Director. Five times during the meeting, one team member or another acknowledged openly that they would have to confirm their design decisions with management before they could be finalized. For example, when discussing instructor competencies about handling difficult students, the team agreed to first confirm with Larry, the Academic Director, what would be the Institute's policy on this and then adjust the course to reflect that policy.

During their discussion, team members were always aware of their organizational context and culture and how it influenced the course design. They talked about the type of students who would attend their classes and how dealing with those who were not used to taking training, for example, could impact their teaching. They acknowledged that some instructors at the Institute were set in their ways and reluctant to change. When discussing the competency 'be open to change and improvement', for example, the team agreed that this would be a "hot potato" because of the resistance to change amongst instructors.

It was also apparent that Peter played two roles during this meeting: he was first a team member who participated openly in design discussions and was second a project manager concerned about keeping the process orderly and productive. Before the meeting, he reviewed the team's previous discussions and

entered that information into the CMS. At the start of the meeting, he confirmed with other team members that they had the documents, understood their structure and content and were ready to proceed. He checked regularly and openly with them to ensure they could all freely express themselves and that they agreed with the decisions made. He therefore regularly asked the team questions like "do we agree on this point", or "are we ok to continue?" He remained aware of the time used for discussions and of the need to remain productive, stating at one point "So moving on, I'm looking at the clock, it's a quarter to ten and we're still on the first page, there's a lot of pages here. I don't want to rush it but at the same time I want to move on and like I say we can always come back to things." He ended the meeting by reviewing the work just completed and suggesting agenda items for the next meeting. Team members seemed to appreciate this structure and did not question at any time Peter's role as project manager.

The team continued using an iterative cycle of individual and team work to complete next tasks: each team member first completed some work individually in preparation for meetings, shared their work with other team members at meetings and worked through issues and decisions with them. As Rick explained,

> "[Peter] asked us to take maybe one to three topics, each of us on our own, any that we may be interested in, and research them and put them down with the idea that later on we'll go back as a group and review it."

As worked progressed, the team cycled through discussions linking competencies to objectives, objectives to content, content to levels of detail (for example, differentiating 'need-to-know' from 'nice-to-know') and deciding on instructional means and methods. Team members regularly asked each other how they handled instructional duties and tasks and how instructors at the Institute should do things to be successful. They often told stories of their own experiences as instructors or of what they had seen other Institute instructors do to explain what they believed would help create a better instructional techniques course for all instructors at the Institute.

The cycle that started with individual work, continued with group discussions and concluded with agreements about what to include in the course and how to teach it worked well for core team members who were pleased with their progress. Dan, for example, explained that,

> "The last couple of meetings we've had, have just… I think have been fantastic; [all core team members] were there, so we were all participating. We had really good discussions. We finalized the ordering of the competencies, what's going to be taught first, what's going to be taught afterwards [and how to go about it]."

Robert added,

> "It's been a struggle but generally speaking it's gone very well. A lot of very good discussion as to our own particular needs and that's important

> because we're an unusual organization [in that] not all of our training is done in the classroom, [much of it taking place on the job]. So we really have to take all those things into consideration… It's been very interesting going through this and I think the end result is going to be a very good product."

During this time, Peter continued making efforts to help the team prepare for meetings and discussions by assembling information, suggesting content or proposing ways to tackle problems. He saw that as a form of rapid prototyping - a way to more quickly produce models and mock-ups of teaching and learning materials for testing and feedback. He believed rapid prototyping would be particularly well suited to the project and participatory design, explaining,

> "We're mixing different things as part of our [work] to get us to the participatory stage. It was obvious that a lot of people were nervous to put something on paper, because they were afraid they might make mistakes. So I found that by just putting down a paragraph under a topic, whether it was right or wrong, and offering it to the team there was no limit to the participation. And all of a sudden the product started to build beautifully. So what I have done is I've been steaming ahead with a rapid prototyping kind of concept populating the content to give to the team to round table. And the discussions have been thorough: they've been really good."

Using rapid prototyping is another example of how a team can rely on different techniques to co-design learning solutions. Like a DACUM, rapid prototyping does not originate from participatory design but was used instead during participatory design because at least one team member believed it could be useful and recommended it to other team members. During one of our first interviews, Peter stated that he was familiar with rapid prototyping and very much appreciated this approach as a way of moving things forward. He had studied rapid prototyping while completing his Masters Degree in Education and considered it a valuable way of testing ideas and options early in a process to confirm directions and avoid wasting time doing work that would not be useful. As he explained,

> "[The university] spent a lot of time on the ADDIE [model], of course, and the thing that I kind of cued up on was the rapid prototyping, because that's what I was more familiar with doing in the past, more by luck than design… When I studied the rapid prototyping, I saw that it could really work well with the way we're doing things."

Four factors specifically influenced Peter's opinion about using rapid prototyping in this project. First, he was already familiar with rapid prototyping. Second, he felt that this approach fit well in an environment like the Institute where practical experience and results were highly valued in decision making. Third, it worked well in this project, helping the team to get started and stay

focused on important points. Fourth, by starting with what was obvious or what could be more easily dealt with, it helped to focus team discussions on more difficult or complex problems requiring greater attention and discussion.

Rapid prototyping therefore played an important role during this phase of the project and to design the course generally. Team members liked this approach because it helped them track their progress more easily, as reflected in different versions of the course documents they created during the project. In this way, the team gradually prepared all course documents.

Members of the core team completed the following activities during this phase to create an instructional techniques course.

1. The team confirmed that it identified all relevant instructor competencies from reputable sources (like those developed by the International Board of Standards for Training, Performance and Instruction (IBSTPI)), and those best reflecting their needs and characteristics.
2. It was decided that the course would be delivered in class using a face-to-face instructional format. This decision was influenced by three factors. First, traditional classroom instruction remains the method of choice for courses at the Institute. Second, management and the project team were concerned there would not be enough time (and qualified resources) to develop lessons in another format, like e-learning. Third, the team decided early on that the course should include as many opportunities for students

to practice new instructional skills as possible, making classroom presentations an essential course feature because instructors would apply these competencies in the classroom.

3. The instructor competencies that were selected for inclusion in the course were grouped to form broader topics that could be divided into lessons. For example, planning and preparation became a major topic that included identifying learner characteristics and sequencing content for instruction

4. Each lesson was discussed in detail to confirm objectives, related content, teaching and learning activities. Once lessons were identified and sequenced, the team discussed how best to instruct them and decided that lessons would generally be taught by an experienced instructor working with various experts (for example, to discuss the types of problems adult learners might face at the Institute) to properly address all topics. They also decided to follow constructivist learning principles whenever possible to get students involved in the learning process. During one meeting, Peter explained what he meant by constructivism by stating:

"The concept that we're using here is a constructivist concept in instruction where we try to get our learners to bring out the material. The instructor will know the material that has to be covered based on the content that's in [the course manuals]. And we'll try to bring everything

out through questioning and hopefully leave all of the knowledge construction to the candidates themselves."

Deciding to use this approach led the team to make another decision about how to structure the practice teaching exercises in the course. Because new instructors at the Institute typically started by teaching courses documented in existing lesson plans, the team decided that course participants would prepare and present lessons on the different instructional skills described in the course documentation. The course instructor would teach the first few lessons to introduce the course, discuss the new standards being introduced at the Institute and create a conceptual framework students could use to situate their lessons within the course. As a result, students would learn part of the course content by teaching it to others while also practicing how to use different instructional techniques. This approach would later raise concerns during the pilot phase.

5. The team reviewed what should be evaluated during the course and how to carry out evaluations. They first discussed different ways to evaluate course participants in terms of the standards to be met and how best to confirm how each participant met them. They then considered how to document and track student performance during the entire course, so that the final evaluation would not be influenced by any specific event or performance during the exercises. Finally, they reviewed how best to

provide feedback after teaching practice exercises to address the real problems observed during these exercises and otherwise suggest improvements in a helpful and constructive manner.

As a result of these discussions, the team developed forms and other tools to collect information on student performance and document decisions emanating from student evaluations.

6. The team decided early on not to focus too much effort on designing high quality instructional materials. They defined high quality instructional materials as being relevant and useful, complete and well presented. They therefore associated high quality with a finished product that would both help individuals learn and be enjoyable. They would focus instead on ensuring that the content was complete, on having the exercises they felt were important to practice instructional techniques, and on ensuring that course overall was a pleasant learning experience. They agreed that the course could be improved over time and that learning materials would be adjusted as needed to make the course both pleasant and useful. They therefore focused their efforts on preparing a facilitator's and a participant's guide with enough information to help teach and complete the course. The facilitator's guide included appropriate teaching notes and the participant's guide included a summary of the content presented and guidance for exercises.

7. The team finalized, reviewed and validated all course documentation including the instructor and student manuals.

The team kept all design-related work on the course in the CMS. In addition to serving as a central repository, the use of the CMS provided practical experience in using this tool to create course documentation that could be easily maintained and shared between instructors.

Worked continued along these lines until the core team was satisfied that the course was complete and ready for pilot testing. They reported in late November to the Academic Director that they were done preparing the course and that it was ready to try in a pilot. Team members were pleased to have met their deadline of having the course ready for delivery by December 2009, despite the problems encountered along the way. They looked forward to the pilot, to taking the course and to finding out whether it would perform in practice as they had intended. The course outline is it appeared in the CMS after completing the course design is included in Appendix F.

The Experience of Being Involved in Participatory Design

During this second phase of the project, core team members continued developing an appreciation for using participatory design to create courses they would take. They valued team input in particular and working together to co-

design the course. Peter believed that team members would benefit the most since they were able to first learn about instructor competencies and instructional techniques, and second how to present them in a course to improve their own instructional skills. He echoed the team's comments about the value of bringing together different types of experience and expertise to co-design a course, stating "I welcome the participatory methodology because I got to see firsthand how much advantage you can get from having different types of personalities and different types of knowledge or experts in a team".

Robert was adamant that using participatory design was key to having better discussion between team members, and to get more varied input from people who would eventually take the course. He believed that participatory design also helped the team make better decisions about what to include in the course and how to present it. Other team members shared his point of view. Rick, for example, saw a benefit in getting more people involved in discussing what to include in a course and make relevant decisions instead of relying on one or a few people. William felt the project was a good experience, concluding he believed strongly in participatory design. Ernie felt the same even though his situation forced him to work with other team members at a distance for most of the project. Dan was convinced that many of the things that were important for the instructors in his department would likely have been overlooked if the course had been designed by a single instructor, or by instructors from another department. As a

result, he was convinced that working collaboratively was the best way to create learning events that what would meet the needs of co-designers.

Core team members also felt that part of the reason they were successful using participatory design was because they worked well together as a team. When asked during interviews about their experience as a team, they individually reported that working with other core team members was a positive experience, but that it was less so when working with extended team members. Core team members agreed that each one had been very open and respectful of others' ideas and that there had been no need to 'sell' or otherwise defend opinions. William in particular appreciated the camaraderie that developed between core team members during this participatory design.

Overcoming Obstacles

Core team members faced three key problems during the project that impacted the project overall and this phase of the project in particular: continued opposition from some departments and their representatives in the extended team about developing an instructional techniques course adapted to the learning needs of the instructors at the Institute; finding time for the project in an otherwise busy schedule; and, an unexpected change in the scope of the project. The rest of this section describes these challenges.

Difficulties Between the Core and Extended Teams

The differences of opinion between the core team members and some department heads and their representatives on the extended team about designing an instructional techniques course in-house continued to dog the project throughout the design phase. These differences were apparent during team meetings that were attended by both core and extended team members and in the comments Peter heard from some department heads. Because of this, core team members spent much time during phase 2 reviewing basic arguments about the project and the importance of adapting the course to the needs of the instructors at the Institute, to try and resolve differences with other team members. Extended team members, however, were not easily convinced and continued to participate intermittently and defend their opinions. The composition of the extended team changed a few times during the project but new members expressed similar concern as their predecessors.

Core team members eventually became frustrated with what they perceived as blockage and expressed their frustration openly during individual interviews. Peter explained that,

> "It's been a difficult process because other departments have been bringing people in, or not, and we've had a lot of review along the way. And I've found that kind of frustrating. It would have been much better if we had everybody at the table to begin with, but you see if we have a new

> member every second week, then we have to review what's been done, explain things, and then they sometimes want to argue points that were already taken care of."

When I asked again about the interaction between core and extended team members during my second interview with Robert, he added,

> "Yeah, well much has happened obviously. We've really gotten into it and it's been a difficult process because other departments have been bringing people in, or not, you know, and we've had a lot of review along the way. And I've found that kind of frustrating... There's a lot of frustration at least from myself and perhaps from one or two others who have been in there since the beginning, you know, and are going 'oh my god we're talking about this again! This is the eight time this has gone around the table'. And some people came in with preconceived notions of what we were doing, what we should be doing and it's like oh, we had to go through this whole argument and lead them to water again."

Rick deplored that not all departments were willing to participate and contribute to the design process: "As far as the people who'll actually be using this course, ideally it would be nice to have input from everyone". For William, poor participation from some departments became "what would be my strongest criticism or disappointment with the whole process". While recognizing that the

extended team's behavior reflected the organizational context and culture at least to some extent, he deplored

> "Not getting buy-in [from participants] or [departments] not taking advantage of the opportunity to provide an opinion. I would say that there's definitely been an effort made to reach out and to involve people, and help them to feel that it's up to them. If they choose not to participate and to just remain opposed, you know against it, that's their own choice but it's really not based on fact, that everyone was given an opportunity to come forward and be a part of this. For some reason, some people… I noticed some departments the reason seemed to be that they just did not want an internal course. They want a course delivered by an outside external contractor."

When I asked the members of the core team what in their opinion might have caused the extended team's behavior, they highlighted two important reasons.

- First, they acknowledged that problems recruiting more permanent executives at the Institute had over time allowed departments to become more autonomous, make their own decisions about how to prepare for and deliver courses, and create "silos" that created distance between departments in terms of working together and helping each other. The differences among departments that emerged as a result of working more

independently were emphasized over time making it increasingly difficult for departments to resolve them and work together. During the time this project was completed, departments at the Institute continued to work more autonomously than they did together, and reacted cautiously to proposed changes.

For core team members, that reaction to change partly explained why some department heads and members of the extended team did not support the project. For example, departments were reluctant to use the new CMS since this meant learning to use new software and a different approach to developing and documenting courses. One department in particular that argued against developing the course internally had made a commitment some years ago already to use a more traditional, ADDIE-like model to plan, prepare and deliver courses. They trained their instructors to use this methodology and all of them now knew how to use the tools and techniques in place. Changing to the CMS would not only mean training all department instructors to use this software but also how to follow a competency-based methodology to create courses. Because this would require much time and effort and because department instructors believed their approach worked well, they did not see why they should change and adopt the new CMS.

Peter recognized that departments were reluctant to start using the CMS but interpreted it as a training issue:

> "Many instructors do not yet use the system, but in time they will. The Institute has made this clear to all staff based on a Management Board decree. The issue is one of teaching people to use the software. The [instructional techniques course] is the first step in a complete overhaul of how we prepare our instructors, with courseware application and development in the CMS as the end goal… No one wants to make time to change over [their] content into the CMS, as that takes time they do not have. Thus the changeover will be a lengthy one."

William, however, saw things differently:

> "There's still maybe some reluctance to adopt the [CMS] and there's also some reluctance to adopt an internal [instructional techniques course]. So I think it might be safe to say that some… or at least one branch would rather receive the training from an outside agency rather than an internal one."

If a department could send its new instructors to take the same external course that more experienced ones had taken before, then everyone would follow the same instructional principles and practices. But

if the Institute adopted another approach, then departments would have to not only train new instructors but re-train more experienced ones.

- The second reason invoked by members of the core team to explain what might have caused the extended team's behavior was their belief that extended team members were influenced by personality conflicts or other problems more directly reflecting people's perceptions of one another (like rejecting some people's professional experience and qualifications). Peter, Robert and William were aware of and understood this problem well, given their number of years working for the Agency and the Institute, but others also felt it. As William explained it, some resistance was directly attributable to,

> "A personality conflict with Peter; he was a [profession] and for some reason [they] don't seem to be respected here… That's a cultural thing and I find it a little bit disturbing. But they realize it themselves. You know it's very, very obvious."

During an interview, Ernie cautiously recounted personal experiences that illustrated how some professionals working with the Agency were not as well regarded as others. As a recent university graduate who had developed significant expertise in a field relevant to the Agency's activities, he found being accepted by his new colleagues quite difficult, partly for having a different education and work history and

partly from belonging to a group in Canada with a different language and culture than that of his colleagues.

When I visited the Institute during the course pilot, I was able to observe how it was in many ways a complex organization with multiple value levels: organizational values promoted by the Canadian government and reflected by the Agency; values at the Institute reflecting its tradition on the one hand and new developments on the other hand; and personal values that did not always align well with other values. Fundamental differences in values persisted during the project and were not fully resolved.

The codes that emerged from the data about difficulties between the core and extended teams reflected words like ‘not participating’, resistance’, ‘culture’, and ‘contribute’. I eventually grouped these codes under the category of resistance to change , but could also have grouped them under the categories of context or team dynamics. I selected the category of resistance to change because it most closely reflected the data gathered on this issue. However, I decided to consider this category under two themes: first, under the one about context and second, under the one about the team experience of using participatory design.

Time to Participate

Finding time to participate remained a key issue for core team members. Rick, for example, was already concerned about his availability to participate early in the project, explaining in our first interview that finding time to participate would become difficult for him when the academic year resumed in September: "My only concern at this point would be that [the project started this] summer and during the summer my course load is fairly light. Now come September, it's fairly heavy [and] if it gets heavier than [attending meetings] then it might be more difficult to contribute to the project."

Later on, when I asked him what he believed had worked well in this project that used participatory design to create a course, Rick summarized well the comments I had heard before from other core team members:

> "I don't know if I'd do it much differently other than trying to get a situation where you have people with this as their main focus as opposed to trying to fit it in when they have time. It's… I think the biggest difficulty with this… with everyone's schedules being different and busy. We've been managing as far as filling people in when they miss but it's not ideal. I think ideally you want everyone at every meeting and taking part in every meeting. But finding a time where everyone can set aside, you know a bunch of time to take part in something like this is definitely a challenge. It seems that every meeting there's at least one person that can't

take part… It's almost like a project: in order to have full participation all the time, you almost need to set aside time where that person is taken away from their regular job and allowed to [focus on the project]."

Rick was not the only participant concerned about not having enough time to participate, or who's participation was affected by his workload. All core team members confirmed they had missed a few meetings or had trouble completing assignments because of other duties.

To illustrate some of the difficulties core team members faced when trying to find time for the project, Peter and Dan were both promoted to new positions during the project that required time to learn new roles and responsibilities while still continuing with this and other projects. Robert and William had to juggle multiple assignments that often involved traveling away from the Institute. Ernie participated at a distance and was not able to attend all meetings, while Rick expressed his concern about "fairly busy course loads and with other stuff going on too" in three of his four interviews. Core team members therefore each struggled in their own way to reconcile the demands on their time. The project relied on their personal commitment to do the work involved and achieve stated objectives.

The team's reactions to the problem of finding time to participate were clearly apparent in my interview notes and were coded for analysis using words like 'busy', 'available' and 'time to participate'. These codes were first grouped

into the category of availability and then eventually became part of the theme on the influence of the context on participatory design. While it could also have been seen as part of the personal experience of using participatory design, it was more appropriately placed under the theme of the project context because availability was largely determined by staffing issues beyond the participants' control.

Transitioning to a Standing Committee

The core team faced another challenge when senior management stated it wanted to explore the possibility of transforming the project team from a temporary group to a more "permanent subcommittee at the Institute on academic excellence". Larry explained that there had been a previous version of this committee at the Institute but only in an advisory role. He now wanted to implement a new committee on academic excellence with the authority to make and implement decisions: "the plan is clearly to establish governance, to have a body in place that will focus on finding the right people and getting the right advice to make good decisions on a timely basis". Because that sub-committee would include members from each department and because they would work closely together, he believed it should be possible to build on the work done by the project team and on the good working relationships that had developed between core team members in particular to help get the new committee started.

Peter considered this good news because he agreed with Larry about the need for a more permanent subcommittee on academic excellence. He explained in an email to other team members about mid-way through this second phase that "I expect that the Basic Training for New Instructors (BTNI) workgroup will not be the same group by the end of this process as it was when we began, but that is because we have moved forward with the concept of a standing committee".

As Peter explained, the Institute had long debated the need for a more permanent committee responsible for developing and maintaining instructional standards and providing guidance to instructors as needed. After assuming the position of Academic Director, and given his mandate to improve the quality of instruction and implement standards, Larry decided to establish this standing committee and have it approved by his superiors.

However, the decision to establish a standing committee and transition existing team members to it was not discussed with them. As a result, they first heard about Larry's intention to form a standing committee from Peter during a team meeting. Core team members were not happy with this news and it remained an important concern for them throughout the project that emerged clearly during axial data coding.

Peter appreciated that some departments and instructors at the Institute might not support the proposal to establish this new standing committee but may have misjudged the reaction of fellow core team members. When I interviewed

them shortly after plans to form the standing committee were announced, all core team members except Peter expressed concern about this in one way or another, stating in some cases they would not have joined the project had they known about these plans to form a subcommittee on academic excellence. As Rick explained,

> "If the goal is to take this group and make it the official committee, well then do I want to be a part of the official committee and, if not at what point should I be looking at being replaced by someone else? For me personally, I kind of felt like you just kind of got pushed along into this direction that I had no intention of going, you know… The path seems to be getting bigger and bigger, and longer and longer. And I don't know if I want to go that far with it."

Robert explained he would prefer "wrapping this up and say, ok, this committee's done, would you like to volunteer for the next one? But to transition it?" He further explained that if existing team members de facto became their department representative on the subcommittee for academic excellence, other instructors might well resent that the same people that participated in the project to develop an instructional techniques course were being given additional responsibilities without considering the potential participation of other instructors. He summarized his thoughts by saying "I think that they should ask for volunteers."

William, who clearly understood he could never be part of a standing subcommittee since his position at the Institute was temporary and since he expected to soon move on to a new position elsewhere, put things in perspective by explaining that,

> "About two-thirds of the way through [the project], Peter was receiving very strong support from Larry [who] had a big impact on the team. Because Peter was saying, well you know management's behind this, this is supported right from the top ranks, from the commissioner's level down, and so on and so on, he made us feel that our input was valuable. And we had a goal. And he started talking about things outside, or above and beyond the instructional techniques course. And that caused a reaction [from core team members]. He had to backtrack and a meeting or two later, over several meetings, he repeated that it's making some people very uncomfortable where we're going and talking about things that are above and beyond the instructional techniques' course, and he was told to focus on preparing this course… and to restrict our goals to that."

Perhaps because of the core team's reaction to the proposed change in their mandate, discussions about the new subcommittee soon stopped and the team continued working on creating a course to meet their needs. Refocusing on the original mandate seemed to reassure members of the core team and their collective mood improved. William explained that,

> "We had a goal and once we stopped worrying about [what would come next], once [management] said we're not going to worry about anything above and beyond the instructional techniques course, then morale improved. This goal kept us interested in being part of the team."

The codes that emerged from the data about transitioning to a standing committee were reflected words like 'committee', 'sub-committee', 'transition' and 'change of mandate'. These codes surfaced in nearly all interviews that took place after the intent to transition to a standing committee was announced. They eventually formed the category of 'standing committee 'and were grouped under the theme of the influence of the context on participatory design.

Project Management and Team Leadership

There was no formal discussion at the start of this project about how this project would be managed or about the need for a project manager. When I first discussed the study with my initial contact at the Institute, the conversation gradually evolved until we acknowledged that the study would take the form of a project led by a project manager. In our next conversation, my contact confirmed that Peter would manage the project.

Before starting this study, I had not much considered the role of project manager in participatory design or its impact on that design process. However, based on the comments from other participants during our interviews and on the

activities underway, it became apparent that Peter's role as project manager was key to keeping the project moving forward.

To better understand the role of the team leader in a participatory design project, I asked core team members individually in subsequent interviews how they felt about Peter's leadership in this project. Responses were unanimous: Peter's efforts were fundamental to moving forward and staying focused. As Dan expressed it, "Peter has been very, very good chairing the meetings: he always prepares us and keeps us on track". William, who missed some team meetings during phase 1 to attend to other duties, felt that Peter "made exceptional effort to keep me in the loop and bring me up to speed on whatever I missed".

Although team members did not discuss project management or how to structure the project when they started, it soon became apparent in their comments that they considered themselves involved in a project that required some structure and leadership. They gladly relied on Peter who became the project manager partly because he replaced his supervisor and my contact at the Institute when this study started and partly because he developed a strong working relationship with Larry that reflected a growing trust between them. In Peter's words, "Larry does not give trust easily but seems to be showing more and more trust, respect and satisfaction with the project".

As the project progressed, it became obvious to everyone that Peter had become both the project manager and team leader. This did not come out of

formal discussions between team members or with management but emerged instead from a need that team members felt for structure and organization. Peter became the one who organized meetings, oversaw using the CMS, ensured team members were kept up to date after missing meetings and kept management informed of how the project progressed.

After I become more aware of the importance of the project manager role and during subsequent interviews with core team members, we often discussed Peter's role as project manager and team leader. At times, I asked them directly about Peter's role and how they felt about it, but core team members also openly commented on his work. Core team members reported without exception that Peter played a vital role in moving the project forward, keeping their work organized and even acting as a buffer at times between them and those who were against the project. As Robert explained: "we're all appreciative of Peter and the amount of work he's done… The work that he's done has been outstanding".

William considered that Peter was

> "the best man for the job. In spite of the fact some people may have had personality issues with him or whatever, there wasn't anybody else that could have taken the bull by the horns so to speak, or taken the role that he did and done as well."

Dan explained that he was grateful that Peter took charge of the project and helped others as needed. He considered Peter the driving force behind the

team. Rick made it clear he depended on Peter to keep Larry informed of their progress and keep the team informed of his opinions of their work. In Ernie's opinion, Peter became the uncontested project leader, to the satisfaction of all other team members.

One final event should be noted that happened during this second phase of the project and that directly impacted how the team worked together and completed the project. It also illustrates well the working relationship that developed between Peter and other core team members and the importance of having someone lead the project. In November, Peter suddenly became gravely ill and had to take extended leave. When I first heard about his illness, I called Robert who worked closely with Peter to inquire about Peter's condition. I then learned that Peter's illness was quite serious and that team members were very concerned about his recovery. This was disturbing news since I was personally concerned about Peter's welfare and could not help but wonder how this might affect the project. Peter's condition did improve over the next few weeks and he was eventually able to return to work and rejoin the team, but not before fellow team members completed the course design and development.

When it became obvious to other core team members that Peter would be away for some time, they took it upon themselves to continue and finish all remaining work to meet their deadlines. During interviews later in the study, I asked core team members about this turn of events and their reaction to it. They

unanimously expressed feelings of "owing it to Peter not to drop the ball". As Robert explained,

> "It was actually Dan who kind of took the lead. Well, between him and William, right. William decided to try and advance things on Peter's behalf to get things moving, and Dan agreed to chair the meetings. We didn't want Peter to come back and this behind schedule on him, that sort of thing."

Dan confirmed what his role had been during this time, concluding that "everything's been round tabled, so we're actually good to go for the pilot." In Ernie's words, "we were happy to have met our deadlines!" It became apparent that although members of the core team appreciated Peter's contribution to the project and to managing it, they did not depend on him to complete their mandate. Instead, team members agreed together on how to complete the remaining work and Peter's role as meeting organizer and team leader was assumed by other team members.

The codes related to project management and team leadership emerged naturally from the data and became more even stronger as the project progressed. They were associated with words like 'organize', 'lead' and 'leader', 'chair meetings', 'keep on track' and 'report'. They easily formed the category of 'project management' and were also considered under the category of 'project

structure'. They were eventually included in the theme of project management and the need for structure in participatory design.

Informal Learning During Participatory Design

Although this research did not explore specifically the links that may exist between participatory design and informal learning, the data for this case suggests that informal learning likely occurred in different ways during this project. For example, William and Robert both commented that because training and education were not a strong part of their background, they had trouble at first understanding what instructional design was about and the terminology used. As William put it,

> "I feel relatively new with the subject matter and it's been more of a learning curve for me. Some of the guys that have been here instructing for a couple of years of course have had more to say at the meetings, and that's good. So, they respected me and they gave me a chance to listen and to learn, and to watch, and that's all been great."

For Robert,

> "[Instructional design was] overwhelming to begin with. Yeah, and the biggest problem I had was that people were firing all these terms at me and I didn't have a clue what they were talking about. And so it's like, woah, woah, slow down! But anyway, I found it a little bit frustrating in

> the beginning, and overwhelming, but once I caught on to it, it wasn't that big a deal."

Informal learning may also have occurred in other ways. Dan, for example, commented that doing a DACUM had been a new activity for him and that he had learned much from it: "Well I thought the design was pretty cool… I must say I really enjoyed it because it's something that I've never done before. I enjoyed doing a DACUM. Yes! That was pretty neat. I really enjoyed that." Rick saw "participating in designing this course as an opportunity to learn about instructional techniques". He also believed that being part of a team effort had helped them better understand and appreciate the challenges other departments faced when designing and delivering instruction:

> "One of the positives too as far as having different departments involved [was that] there were things that I would not be familiar with if it wasn't for other people from other departments… I think it was a good exercise even just from that stand point, just to get a little bit more familiar with other departments and I think it was a good exercise for other instructors to see what's going on in other courses."

Finally, participants likely learned informally about instructional techniques while reviewing instructor competencies and investigating the course content. However, as stated above this study did not explore specifically how

informal learning may have occurred during participatory design and more research is needed to better understand this phenomenon.

Phases 3 and 4: Application and Results Analysis

The final two phases of this project focused on application and analysis of the results of that application.

Phase 3, Application, included two main activities: planning the pilot and conducting it. This phase was initiated by the core team when it considered the course ready to pilot. Key participants included the entire project team but Peter had the primary responsibility for work during this phase, handling much of the administrative work to organize the pilot himself. Phase 3 occurred between January and April 2010. It should also be noted that team members focused their efforts on conducting a pilot course, did not mention or consider other ways to evaluate the course and proceeded under the assumption that this would be their one opportunity to evaluate and improve the course before offering it generally. The team decided itself to conduct a pilot and how best to conduct it.

Phase 4, Results Analysis, involved reviewing the results of the pilot class, determining how to address them, revising the course to reflect those changes, and preparing a final project report for management. Peter initiated this phase. Key participants included core and extended team members, although the analysis of the results and writing of the report fell to the core team members with Peter

taking the lead. In addition to producing the final report on the project for management, the goal of this phase was to try the course and confirm it achieved expected outcomes. The course report was submitted to Larry who remained responsible for accepting or rejecting the course. Phase 4 occurred during April 2010.

By the start of the pilot in April 2010, Robert and William had accepted new positions away from the Institute and Dan and Peter started new positions at the Institute involving greater management responsibilities – and less time for this project. Because he was not at the Institute during the pilot, Robert did not directly contribute to writing the course report or analyzing results. William, Peter and Dan, however, remained available for the project and contributed to the course report and final analysis. Although Rick and Ernie did not change jobs, their existing jobs caused them to juggle multiple assignments that prevented them from actively participating in the pilot class. However, they were copied on the course report and their input solicited to review results and comment on their experience designing the course.

Planning the Pilot

The core team met to finalize planning for the pilot in January, after Peter recovered from his illness and returned to work. The project plan had initially anticipated delivering the pilot in January because course design and development

were expected to be done by the end of November. However, near the end of phase 2, the proposed dates for the pilot were pushed back first from January to February, and then to April to accommodate scheduling problems. When they met in January, team members expected to plan for offering a pilot course in April 2010.

At that meeting, however, Peter stated that in a recent conversation Larry had mentioned that because most departments at the Institute had a heavy workload and that some of them were not fully staffed, it might not be possible to free enough instructors to attend the pilot course in April, and perhaps not before the following year. Members of the core team did not take this news well, reacting first with some consternation and then more angrily. Robert expressed his point of view by stating,

> "I worry what's going to happen here is we're going to get wound up in all this stuff and there's not gonna be any training going. This really makes me angry 'cause we all took time out of our schedules to try and get this done by this deadline of December, 'cause everybody recognized we really need training here for our staff. We can't stop now!"

Peter reviewed the main reasons why the pilot might have to be delayed, including problems releasing instructors to attend the course. But Robert remained unconvinced stating,

> "I understand that whatever number of days [needed] it's hard to take your staff away, but the problem is not going to get any better in the next 1, 2, 3, 4, 5 years, right? We're going to be short handed all the time!"

Other members of the core team agreed with him. The discussion continued for some time until the team requested a meeting with Larry to review options directly with him. That meeting took place a few days later and Larry agreed to keep the current schedule and offer the pilot in April.

Concerns about recruiting students to attend the pilot nevertheless proved well founded. Peter started recruiting participants for the pilot as soon as it was agreed to deliver the course in April and worked diligently to do so during the next few weeks. His intention was to build a class roster that would include members of the core team, other instructors at the Institute and some instructors from different regions. However, even after much work to recruit participants, only five of them confirmed they could attend: two from the Institute - including one member of the core team - two from a region and one individual who still worked in operations but was considering becoming an instructor at the Institute.

Peter was nevertheless satisfied they represented the target population well enough to reflect the expected level of experience and expertise of eventual course participants and that they would be able to provide useful feedback to improve the course. One participant, for example, was an experienced instructor at the Institute who had already completed an extensive instructional techniques

course and could compare the two. A second participant was also an experienced instructor at the Institute, but who had not taken instructor skills training. Two others (including William) were new instructors with little or no previous instructional experience and the last participant supervised training in a region.

The intention at the start of this project was that all members of the design team would attend the pilot course, first to take the course and learn from it and second to experience firsthand how well what they had designed together worked. However, when it was time for the pilot four members of the core team could not find time to attend and only William was available. The others were either away or had already started new assignments. Ernie, for example, very much wanted to attend the course but reluctantly had to admit he simply could not be away from other projects and responsibilities during the time of the pilot. Dan, who became the head of his department shortly before the pilot, explained that

> "I can't free up an instructor because the pilot's going to be over a week long. So to ask an instructor to reschedule all his courses [for that week] is next to impossible. And then it's the same thing from other departments. So unfortunately I think the reality of it is that for the pilot there'll just be people who need this course and not so much anybody who was [on the project team]."

About two weeks before the pilot, Peter sent each participant a letter welcoming them to the course and explaining what would take place. He

described the work each participant would be expected to do, including preparing for and teaching practice sessions. He explained that participants would base their practice sessions on the course content, and that they likely would have to spend time preparing after normal class hours. Because Peter was the only instructor at the Institute qualified to teach the course and since I am an experienced instructor who had taught instructional techniques courses before, I agreed to lead two sessions early in the course on the basic principles of learning and instruction to provide Peter with some relief from teaching. With these arrangements in place, Peter declared everything ready for the pilot and Larry agreed.

Before agreeing to lead some sessions during the pilot course, I considered how this might impact the study or introduce bias. After taking time to seriously consider this issue, I concluded that I could teach some sessions if I assumed the role of guest lecturer responsible for teaching sessions as they were designed. Because the content of the sessions I would teach covered some principles of teaching and instruction with which I am familiar, I could easily follow the lesson plans that were prepared and present the lessons as they were designed.

Leading the Pilot

The pilot course started on a Monday and was scheduled to last until the Wednesday of the following week – therefore totaling eight work days. To get things started, Peter reviewed the course content and structure with the class,

confirming in particular how practical exercises would unfold. When he mentioned that participants would present different course topics to practice new instructional skills, course participants were taken aback and concerned about having to develop practice teaching sessions using the course content. They nevertheless agreed to continue and arrangements were made to divide selected course topics to be covered during practice sessions fairly between participants.

Before concluding the second day of the course, and in preparation for the first practice sessions to be held the next day, Peter again reviewed what practice sessions should include and how to prepare. During that discussion, however, one participant became upset and very vocal about having to present some of the course content during practice sessions. He claimed not realizing before the course that this would be the case and resented not being able to select his own topics to practice teaching - as was the case in other instructional techniques courses he knew of. He argued in particular that the course participants would benefit more from the course if they could select familiar topics to practice teaching and concentrate on practicing instructional techniques more than learning new content. The other participants agreed, making the session increasingly difficult for Peter to manage. Even after Peter pointed out having informed participants this would be the case in the course welcome letter, participants were not convinced and only agreed this was the case the next day, after reviewing their letters.

This was an important issue: if participants refused to complete the practice teaching sessions as planned, Peter and I would have to teach the course content that would otherwise be left out and there would not be enough time in the course to do the same number of practice sessions that were planned. It might also become difficult for me to stay within my role of guest lecturer. After more discussion, however, two participants agreed they could learn much by teaching some of the course content and others also agreed to reserve judgment about the value of this approach until after trying it.

Practice sessions were therefore carried out as planned. Participants found the approach valuable in some ways but were not entirely convinced it was the best way to organize practice sessions in this course. The course participant who first openly voiced his concern about practice sessions remained unconvinced and continued believing it would have been better to let participants select their own topics for practice sessions.

Participants were asked for verbal and written comments throughout the course and reported being generally pleased with it. Because I attended mostly as an observer, I was able to witness class discussions and hear comments directly from participants. They were repeatedly encouraged to share opinions and ideas about the course as they occurred and Peter carefully documented events, comments and suggestions for improvement. Apart from the problem with practice exercises, participants were otherwise pleased with the course, believed it

achieved stated objectives and that it would be useful for all new instructors at the Institute. They recommended some adjustments to the content and course structure that did not change or invalidate design decisions previously made by the project team. The pilot ended on a positive note with all participants indicating they would recommend the course to their colleagues.

Reporting and Closing the Project

Peter, who had gathered all comments and other feedback from participants analyzed the course results and prepared a report for management as soon as possible after the course. Four key criteria were used to evaluate how successful the course was:

- how well course participants achieved the course objectives.
- The relevance and usefulness of the course content and learning activities.
- The course structure and the effectiveness of the learning sequence.
- How well the course met individual participant needs (including their satisfaction with the course).

He reported the problems encountered, what the class decided and the results achieved. He included comments from participants gathered during the course to explain his own comments. For example, he reported the following comment from a participant:

> "I will be recommending this course to any aspiring instructor and to any already employed instructor. Certainly I was completely out of my comfort zone but it forced me to try new things. Luckily the group was receptive to a beginner and did help me a great deal as well. Un-conventional does not always work – but in this case, I believe it was very successful."

Because four of the five pilot course participants agreed that using the course content to practice their instructional skills had been valuable, the team decided to leave the exercises as they were and test them again during next courses. Everyone involved agreed, however, that more work was needed to finish preparing the course and get it ready for regular delivery. The course manuals would need to be reviewed and finalized, some instructional aids added and other adjustments made to the course content.

Peter's report concluded with a recommendation to start offering the course regularly to instructors at the Institute and elsewhere in the regions. His report, however, did not address using participatory design for this course and did not offer any conclusion about using participatory design in other projects. Apparently, Peter was satisfied that Larry was familiar enough with the project and had received enough positive comments informally from core team members about the value of participatory design that it was not necessary to formally repeat them again.

The pilot course was the last project activity and the end of the team's mandate. Because of problems finding a time when all team members would be available, it was not possible for the team to meet again and discuss the results of the pilot course. I therefore met with Larry, Dan, Rick, William and Peter individually before leaving the Institute to gather their final comments and close the project with them. I then called the other team members by telephone to do the same. In the end, core team members all felt strongly about the value of participatory design to create something that truly represented their needs. They believed that the problems they had encountered during the project were not related to participatory design but reflected instead the context of the project. In Ernie's words, "problems weren't about the course or the methodology but rather about the restructuring underway at the Institute. There are still lots of old sores there that are hard to heal." Dan added that,

> "The only downfall is, for participatory design you know, you obviously have to find a common time for everybody to meet and that's just been by far, by far our biggest hurdle. I think [the best part] is the collaboration between the different departments. The worst part, yeah it's to get the people together to collaborate."

Comments like these reflect the need for a framework that helps organize and apply participatory design for workplace learning. Participatory design is not a methodology to organize and manage the projects that are typical of design

efforts for workplace learning. Doing participatory design nevertheless requires having some structure to guide team efforts, support its work and help resolve problems that may come up. The proposed model of participatory design for workplace learning presented in Chapter 5 explains how project management and participatory design can be combined for better results.

When asked if they would use participatory design in other similar projects, core team members showed no hesitation in answering yes, if the organization and project context supported it.

CHAPTER 5: PARTICIPATORY DESIGN AS A METHODOLOGY FOR INSTRUCTIONAL DESIGN

This chapter presents the analysis of the data. It first answers the questions that guided this study on the use of participatory design as an alternative to traditional instructional design. It then explores how participatory design can be integrated into a model of instructional design that takes into account the principles of participatory design discussed in Chapter 2 and the results of this study.

ADDRESSING THE RESEARCH QUESTIONS

This first section reviews and answers the questions that guided the study. After repeating the main question and its four ancillary ones, I answer each one in turn based on the results of this study.

Research Questions

This study of participatory design for workplace learning was guided by the following research question:

Within the context of a specific workplace, how could participatory design be used to design instruction for workplace learning?

Four ancillary questions further elaborate this main one:

1. How does practical implementation of participatory design differ from its theoretical presentation?
2. What practical challenges arise during the participatory design process that would need to be addressed in advanced planning?
3. What is the effectiveness of the resulting learning program in terms of achieving its intended learning objectives? Are there larger performance issues?
4. What type of change management issues arise for instructional designers who are experienced in traditional ISD methodologies?

In the following sections, I first address and answer each ancillary question before returning to the main one and discussing whether or not participatory design could be used as a methodology for designing instruction for workplace learning. To situate this discussion on the research questions, I begin by considering whether or not this project can be considered an example of participatory design.

The Nature of Participatory Design in This Study

Chapter 2 above identifies the basic principles that characterize participatory design and differentiate it from other methods. It identifies the need to get those for whom something is being designed directly involved in designing it as a fundamental condition for using participatory design. Five other criteria are proposed there to show how participatory design can address some of the shortcomings of ISD identified in the literature. These criteria are reproduced here to help confirm that this design process was truly participatory.

- *Participatory design is less about following the steps of a process and more about achieving results through an iterative process of exploration, action, reflexion and adaptation based on ongoing dialogue and collaboration (Spinuzzi, 2005).* The participants in this study were not required to follow an existing process, They decided themselves on how to go about designing the course and debated using specific activities like doing a DACUM. They relied heavily on an iterative process that alternated between individual and group work to find relevant information, review it with team members and make necessary changes to meet their needs. Core team members collaborated extensively through the design process and many attempts were made to equally involve other team members.
- *Participatory design reduces dependence on subject matter experts by getting input directly from learners throughout the instructional design process (CPSR, 2005). Participatory design, however, does not eliminate the need for subject matter expertise which participants may possess or find from other sources as needed.* None of the participants were subject matter experts in instructional design or in instructional techniques. Instead, they were all instructors who wanted to and were expected to take an instructional techniques course to improve their own teaching skills. The team made extensive use of existing documents and other resources on instructor competencies and on instructional techniques to inform their design decisions.
- *By involving learners throughout the design process, participatory design empowers them to co-create learning that matters to them (Muller, 1993).*

Learner input also helps develop more powerful learning environments (Könings et al, 2005) The core team was fully empowered to design a course that met their needs. Management did not question or criticize the team's decisions about designing the course, and the team was able to include in the course what mattered to them. Because there was no comparison between this course designed using a participatory methodology and another one designed using another methodology, the data gathered for this study does not allow confirming whether or not using participatory helped create a more powerful learning environment than would have been possible with another methodology.

- *Participatory design supports interdisciplinary collaboration that is useful to identify and find creative solutions to significant problems (Clemensen et al, 2007).* Although all of the participants in this study worked at the same learning Institute, they represented different disciplines. The participants clearly indicated in their comments having appreciated working with colleagues from different departments and how this type of interdisciplinary collaboration helped improve the course design.
- *Participatory design reflects a constructivist paradigm that recognizes the importance of tacit knowledge and attempts to elicit it through dialogue and developing a common language (Spinuzzi, 2005).* Dialogue and discussion were central to all design activities. Team members helped each other understand the terminology of instruction and instructional design to develop

a common design language. Members explored each other's tacit knowledge of teaching and instruction through stories of their experiences as instructors.

Based on this criteria, it appears that the participants in this study did use participatory design to create a course on instructional techniques. As a minimum, this project met the criteria of getting those for whom something is being designed directly involved in designing it.

Another form of participation at work involves increasing employee participation in organizational decision making. This form of participation, called participatory management, means that staff and not only designated managers influence organizational decisions. Decisions are not necessarily about design but may instead be about any issue affecting the organization and its employees. While a designated manager retains the final authority for making decisions and being accountable for them, affected staff members are invited to provide comments, observations or recommendations to management about them (Bartle, 2012).

The results of this study, however, do not suggest that there was any conscious attempt to use participatory management along with participatory design. Although the participants were allowed to comment on issues that required management decisions and did so occasionally, there was no discussion or attempt to make this a formal and fully participatory process. The team discussed relevant management issues with Peter and relied on him to communicate them to management. In one case, team members took over the responsibility for managing the project while Peter was away, but did so mainly because they were eager to complete the project on time and to not let Peter down. In another case, team members insisted on meeting with Larry to discuss possible dates for

offering the pilot course. This meeting, however, focused on resolving a specific issue and was not part of an accepted process to regularly get staff input on organizational decisions. There is otherwise no evidence suggesting that the participants were familiar with or tried using participatory management.

It should also be noted that some of the participants in this study did not participate as extensively as others and that some members of the extended team tried changing the project. As a result, it was difficult at times for members of the core team to work together and follow the principles of participatory design. It is not uncommon for projects in organizations to have both supporters and opponents but the impact of having some dissent about the project may be greater when using participatory design than when using other design models because participatory design requires extensive collaboration. This underlines the importance of preparing well for a participatory design project including identifying and dealing with as many obstacles to collaboration as possible before getting started. Because the issues that surfaced between the core and extended teams were not identified and addressed early in this project, they continued to impact the design process throughout the project.

Answering the Ancillary Research Questions

The following sections provide answers to each of the four ancillary research questions.

How Does Practical Implementation Of Participatory Design Differ From Its Theoretical Presentation?

As discussed in Chapter 2, participatory design is more often described in terms of principles than of prescriptive steps like those found in traditional models of instructional design. It draws on different methods and techniques and tends to follow phases rather than specific steps with predictable outcomes. Because participatory design emphasizes collaborative problem solving and decision making more than completing steps, researchers tend to select techniques and activities based on context, individuals involved or the specific nature of the design problem.

The theoretical presentation of participatory design found in the literature does not consistently identify one particular set of principles or best practices to apply during participatory design. Some authors, for example, refer to broader principles emphasizing the human and social aspects of participation and collaboration, stressing the importance of,

- Respecting users regardless of status.
- Seeing actions as situated in particular contexts.
- Recognizing workers as prime source of innovation.
- Dealing with human actors rather than other cut-and-dried factors (like completing tasks).
- Addressing real workplace problems and finding real ways to improve the working lives of co-participants.
- Recognizing that work is fundamentally social and based on cooperation and communication (CPRS, 2005; Stanford University, 2007).

Other authors discuss more what could be considered good project management practices when using participatory design. For example,

- Ensuring full participation and having management support.
- Specifying expected time and effort.
- Resolving conflicts.
- Providing essential tools and equipment.
- Using prototyping to explore options.
- Following an iterative process (Bjerkness, 1993; Stanford, 2007; Clemesen *et al*, 2007; Spinuzzi, 2005).

This case study tends to confirm the theoretical presentation of participatory design in the literature and the importance of considering both the need for active participation and collaboration, and for effective project management. The following paragraphs further explore how the theoretical principles linked to participation and collaboration, and then those associated with project management apply to this study.

Participation and Collaboration

The first principle of participation and collaboration identified above emphasizes the need to respect users regardless of status. The status of an individual can be defined as a position or rank in regards to others, or a relative rank in a hierarchy of prestige. While an individual's status may reflect an official classification, like someone's marital status, it often also reflects personal judgments about others. For example, the importance of social status can be seen in the use of terms like athlete or nerd: while athletes are often highly regarded in modern societies, nerd "is a derogatory stereotype of a person

typically described as socially-impaired, obsessive, or overly intellectuals" (Merriam-Webster Online Dictionary, Wikipedia, 2012).

The results of this study tend to support this principle inasmuch as members of the core team did refer to status as a reason to explain some of the difficulties between themselves and members of the extended teams. Because more than half of the participants referred to status during our interviews to explain these difficulties, it represents a strong pattern in the data. When I asked members of the core team why in their opinion those of the extended team did not support the project, four of them (Peter, William, Robert and Ernie) referred to perceived differences in status in their answers. For example, although Peter was formally assigned the role of project manager by the Institute's senior management, because he had previously occupied a position that was considered less important than other ones within the Agency some instructors at the Institute did not consider him a credible project manager and team leader. When I asked William during our third interview why he believed that the members of the extended team showed such a strong preference for attending an instructional techniques course outside the Institute, he explained that "the first thing that comes to my mind, and I'm reluctant to say it, would be a personality conflict with Peter. That would be the first thing that would come to my mind. You see, Peter came in as an instructor from [an operational position]. He was a [position] and for some reason they don't seem to be respected here. Anyway, that's beyond me but … that's pervasive. All through the Institute there's a general lack of respect for [position]. That's a cultural thing and I find it a little bit disturbing. But they realize it themselves. You know it's very, very obvious. So there's this background, there's this cultural clash."

Ernie, who started with the Agency in the same type of position that Peter had previously occupied, confirmed that the Instructors at the Institute considered those with his professional background as less qualified than they did other instructors. He also expressed concern that his cultural background, another form of status, sometimes made it more difficult for him to be accepted or taken seriously by some colleagues. Because he is part of a cultural minority in Canada that has historically not always been well regarded by the majority, he felt it was often more difficult for him to present and discuss ideas during meetings and other forums because of his social status. In his third interview, he confirmed that a "personality conflict" between instructors at the Institute and Peter impacted what happened during this project, that it came from issues not related to this project but related instead to the culture that grew over time at the Institute.

At the same time, the status of individual team members did not seem to concern the core team members. During the study, I was not aware of any discussion or difficulty that may have arisen between members of the core team because of their status or other individual differences. For example, core team members did not treat those from the professional development program any differently than those from the academic program. They also did not filter or qualify the comments of others based on their work history and did not assign tasks based on the level of their positions, previous experience or any other form of status. Instead, Dan and Rick both expressed their appreciation that they were able to participate equally with others and discuss their challenges as instructors in the academic department and how to address them in the course design. In turn, Robert and William stated during interviews that getting input from the academic

department was essential to design a course that addressed the needs of all instructors at the Institute.

It should be noted that because some instructors who were members of the extended team chose not to participate regularly or constructively, the data gathered during the study reflects more the experience of one group of instructors at the Institute than that of the organization as a whole. Had it been possible to interview all team members, including those of the extended team, the data gathered might have provided a broader perspective on the issues that surfaced about participation and collaboration. As discussed in Chapter 4, members of the core team very much regretted that some instructors did not participate, using words like "frustrating" to describe their experience. Core team members were very much aware of how important it was to consider the needs of all instructors to design an effective course on instructional techniques and that not doing so could limit the effectiveness of what they designed.

Optimizing participation and collaboration requires assembling a group of individuals willing to work closely together to achieve a common goal. Groups of individuals with complementary skills that commit to a common purpose, set of performance goals, and approach for which they hold themselves mutually accountable demonstrate having the essential elements to become a team. Team performance is then an emergent property that is only possible through coordinated and goal-directed interaction (Katzenbach & Smith, 2004; Salas and Fiore, 2004). At the same time, perceived individual differences and how team members treat each other because of those differences can prevent a group of individuals from becoming a true team that performs well. In this study, core team members were motivated to participate in the project and

co-design a course to address their needs. Perhaps because they agreed with and supported the project, they seemed less concerned with or influenced by individual differences than were members of the extended team. In turn, the behavior of individuals who did not support the project may have been much influenced by perceived individual differences. In any case, comments from members of the core team like those noted above strongly suggest that perceived individual differences like those associated with status negatively impacted participation and collaboration between members of the core and extended teams.

The use of teams in organizations to complete various tasks has steadily increased over time to become a defining characteristic of all types of organizations (Katzenbach & Smith, 2004; Salas and Fiore, 2004; Schein, 1996). In this study, participation took the form of team work and participants regularly referred to themselves as a team and as members of that team. Because of the growing role and importance of team work in organizations, because of the need for active participation in participatory design and because participation in projects often takes the form of team work, participatory design for workplace learning can be expected to involve and require effective team work to be used successfully in the workplace. Effective team work, however, will be impacted by how team members perceive and behave towards each other. Resolving or setting aside individual differences - like status - may become a determining factor in the extent and quality of the participation and collaboration participants will be willing to invest in a participatory design project.

The roles that team members assume may also impact how well the team functions. In this project, team members had more than one role: they were both

instructional co-designers and users of the training they designed. The participants in this study were recruited specifically because they were instructors who would eventually take this training, but also worked together as co-designers. Nothing happened during this the study to suggest that team members acted differently depending on the role they perceived themselves to assume at different points in the project. This may not be the case in other projects in which team members are either individually assigned roles or else when roles are assigned to sub-groups instead of individuals. More research is needed to explore how team members participating in an instructional design project for workplace learning may behave and collaborate differently depending on the roles they are assigned.

Seeing Actions as Situated in Particular Contexts

The second principle identified above from the theoretical presentation of participatory design in the literature states the importance of seeing actions as situated in particular contexts. The context for a project can be defined as its setting in terms of the elements included and their interaction, or else as the conditions in which something exists or occurs. It is further defined in the literature as "the set of factors surrounding a phenomenon that exert some direct or indirect influence on it – also characterized as explanatory factors associated with higher levels of analysis than those expressly under investigation" (Whetten, 2009) . The elements of context may be human, situational, historical, cultural or otherwise. Human minds use context to sort through information, gain understanding or find meaning, and the influence of context has been noted in the

school and classroom, and in the workplace (Griffin *et al,* 2009; Wright *et al*, 2004; Pellegrinelli *et al*, 2007; Whetten, 2009).

Although the participants in this study did not discuss in detail the possible influence of the context in which they worked on the project, a strong pattern in the data emerged about the effects of context when more than half of them commented during meetings and interviews about the effects of past events on how things worked at the Institute, about departments working in silos or about the effects of the organizational culture on perceived individual or group competence, these comments and the events that took place during the project strongly suggest that the prevailing context at the Institute during the study affected the project and the work of participants. I identified in Chapter 4 three main problems that surfaced during the project and that impacted the project overall, that all reflect the influence of the work context:

- Facing strong opposition from some departments about developing an instructional techniques course adapted to the learning needs of the instructors at the Institute.
- Being continually challenged to find time for the project.
- Dealing with an unexpected change in the project scope and the team's mandate.

These problems all reflect context in one way or another. For example, the project that was used for this study started after senior management decided to introduce new standards and work processes to improve the quality of instruction at the Institute. Introducing new standards and work processes, however, challenged existing ways of doing things that reflected departmental preferences that had emerged over time. Not all departments welcomed the new standards and work processes - like those brought about

by introducing the CMS - and therefore challenged the project. At the same time, they neither challenged using participatory design as the project methodology nor using any particular content or activities in the course being designed. Instead, they challenged the need to design a course specifically for the Institute. The data from this study suggests that departments would have reacted similarly to any other project that introduced new standards or work processes. The underlying causes of disagreement or dissatisfaction with the project were therefore more about existing ways of doing things and proposed changes than about participatory design. Nothing noted or observed during this study suggests that the reaction of different departments or individuals to the project was about using a participatory design methodology.

Management initiated this project to introduce new instructional standards at the Institute and launched it before formally discussing it with faculty. Because the Institute is structured hierarchically and because its organizational culture reflects many of the values associated with the military – like respecting the chain of command – deciding unilaterally about projects was likely considered typical of how decisions were made at the Institute. Using this top-down approach, however, may have frustrated some instructors who were not convinced the project was necessary. It may also have helped reinforce existing negative opinions about management's ability to provide effective leadership. These contextual factors nevertheless affected the project.

During my interviews with them, core team members identified a number of other factors or events related to context that directly or indirectly affected the project. They all identified factors related to change, like using a CMS and introducing new instructional

standards; and others related to the structure of the Institute, its culture, accepted practices and recent leadership problems.

This case study therefore tends to concur with the literature about the importance of taking contextual factors into account when using participatory design. Accounting for factors, however, does not mean changing the participatory design methodology but rather ensuring that contextual factors are clearly identified and fully considered during the participatory design process. In this study, for example, using participatory design may have been easier, or else collaboration between core and extended team members may have been more successful, if some contextual issues – like implementing the transition process - had been addressed directly and separately from course design issues.

Addressing Real Workplace Problems

A strong pattern emerged from the data with respect to focusing on a problem that was real and meaningful to project participants and to stakeholders. All participants indicated in their comments during interviews that they believed it was important to design a course that would address both personal and institutional needs. The project therefore clearly focused on addressing a real problem in the workplace that mattered both to the sponsoring organization and to the study participants. Management sanctioned the project, allowed project teams to be set up, provided the team with clear objectives and reviewed outcomes to ensure that the course met their expectations.

The purpose of the project was regularly challenged throughout its duration and both management and the core team often had to explain or justify their actions and decisions. It is unlikely that management or the core team would have met these

challenges if they didn't believe that the project addressed a real problem that mattered to them.

Core team members were motivated to participate in this project because they believed that the course they were designing would help improve their instructional skills and those of their colleagues. That personal motivation was a key factor in overcoming problems like finding time to attend meetings and actively participating in the design process.

Cooperation and Communication

With respect to the need for cooperation and communication, nothing in this study suggests that a group of individuals working independently - or else not collaborating well - could have achieved similar results as did the core team. When interviewed, all members of the core team emphasized instead their belief that they had achieved more by working together than they could have if they had worked alone. They talked about relying on each other to design the course and expressed strong views about how working together was fundamental to satisfactorily completing their mandate. Although members of the extended team often disagreed with the core team about what to design, they did not question the need to work together to improve the design process. They were more concerned about the decision to design a course internally than about working collaboratively with others to design any course. The core team adopted a way of working together during the project that involved equally sharing roles and responsibilities. Work that is social in nature is defined as a series of activities involving cooperative and interdependent relationships with others (Merriam-Webster online

dictionary), a definition that reflects well how members of the core team worked together during this participatory design project.

Participatory design fundamentally remains an approach based on human and social interaction to achieve desirable outcomes. If the key principles of social interaction, collaboration and co-creation are not applied, then the method used for instructional design may not be participatory at all. It may still be useful for instructional design, but it would not be participatory design. At the same time, unless collaboration is structured and integrated into meaningful action through a well managed project, even good collaboration may not achieve worthwhile goals and become frustrating for participants. Participatory design therefore requires some structure to organize and optimize efforts and collaboration.

Ancillary Question 2: What practical challenges arise during the participatory design process that would need to be addressed in advanced planning?

This section explores the answer to the second ancillary question. Project management provides a framework for considering the answer. In it, I first describe some of the practical challenges that arose, then explore how the principles of project management identified in the literature on participatory design played a central role in considering how effectively these issues were addressed.

Three practical problems arose during this study that affected using participatory design for workplace learning: time to participate, a change in the team's mandate, and change management issues.

Time to Participate

The first of the three problems that arose during this project was time to participate. Team members were continually challenged to find time for the project, their progress was slowed by often having to review what was previously discussed with new participants, and the team's attention was diverted at times from the project to other issues, like a change of mandate. These challenges are common in the workplace but may become accentuated because of the need for people to work together when using participatory design.

As noted in Chapter 4, the participation of both core and extended team members was affected by individual workloads and availability. All team members were affected by heavy workloads and the need to handle many tasks concurrently, making this issue a dominant pattern in the data. Rick, for example, was concerned early on about having time to participate and expressed it during our first interview. But he also repeated that concern during our final interview when he talked about the conditions that could affect using participatory design in the workplace:

> "The only real negative I think was just the difficulty in trying to get people together all the time, week after week. I think just with our schedules, and you know things that would come up, and just the nature of our work with terms starting and finishing at different dates, with the different departments on different sort of schedules, no one could really say that every day or every week on Friday morning I'll be available. There was always stuff that came up for different people. So I think that was kind of the hardest thing to actually, physically get together in a room, once a week, and have everyone present."

William, who was also quite busy during the project, explained how this affected his participation during our final interview:

> "As you know throughout the whole season I've missed a few meeting due to other commitments. I don't have a really defined role at the Institute and was asked to come in and help out with a number of projects. During the summer I was busy [helping with other training] and then… I've been helping Robert with his course. So, that involves me in outside training and so on, with exercises and so on."

Admittedly, participatory design can be time consuming because it requires a number of people working together to solve one or more problems. If, as previously suggested, participatory design is a team effort, then completing the project can be expected to take more time than if it was assigned to a single, qualified individual, if only by virtue of the time needed for discussion and team work. Although techniques exist to facilitate and improve team discussion and interaction, and therefore optimize time on task, it is unreasonable to expect that a team that makes full use of discussion and collaboration will work as quickly as could a single, experienced instructional designer. Recent research, for example, suggests that it takes between 22 and 82 hours to design each hour of instruction for instructor-led training, with an average ratio of 43:1 (Chapman, 2011). This represents a substantial effort that can be compounded when involving a team instead of relying on one or two designers.

Other than the general comments about time on task that I included in the documents I provided the Institute and the study participants, there was no formal discussion at the start of this project about how using participatory design might affect

time on task and participant availability. Because this was the first time using participatory design at the Institute, neither management nor participants were sufficiently experienced with using this methodology to appreciate how much more time might be needed to complete the project, and then plan accordingly. Although Peter formally requested early in the project that team members be given the time needed to participate and complete the project, there was no specific action taken to make this possible. In retrospect, it would have been preferable to more openly and directly identify and address issues of time and participation with stakeholders and participants before getting started. Perhaps because this was not the case, there were no formal arrangements made to help participants deal with scheduling problems or more easily find time for the project.

Not formally recognizing and negotiating the demands that participatory design can make on time and effort had two consequences in this study. First, not all departments were able to allocate an instructor to participate in the project. One department that was having trouble filling vacant instructor positions could not free anyone to participate in the project, while other department heads clearly indicated that allocating someone to the project would be difficult. Second, it also made it difficult for individual instructors to participate since they had to 'fit the project' within all other demands made on their time by regular duties and responsibilities. This became a serious concern for some team members: nearly all team members missed one or a few meetings to attend to other duties, and Rick in particular openly regretted that team members were not given more time to work on the project. In the end, many team members could not

attend the pilot course because they simply could not get away long enough from their busy schedules to do so.

Changing the Mandate

A second important practical problem occurred when management sought to change the team's mandate and expand it into a standing committee with broader roles and responsibilities. Because team members were not initially aware that management might expand their mandate and because they were not prepared to simply assume these new responsibilities, they were not comfortable with this change and were distracted by it for some time. Some of the time available for design was therefore used to discuss proposed changes in the mandate and how it would affect the team. All team members discussed this problem during our interviews thus creating a dominant pattern in the data.

This practical problem may have been avoided by taking more time to clarify roles and responsibilities at the start of the project. Doing this early on may have helped all concerned understand that they faced two problems – designing a course and implementing new standards – that should be addressed separately. As previously discussed, following recommended project management practices could have helped identify and alleviate this problem.

Change Management

The third practical problem encountered in this project concerns recognizing and handling problems or issues in the environment or context not directly about participatory design but that impacted its use and the outcomes achieved. In this study, for example,

the use of participatory design was directly influenced by other changes underway at the Institute that concerned both departments and individual instructors, and that at least partially influenced their reactions to and involvement in the project. All core team members referred at one time or another during their interviews to long-standing problems at the Institute, to the changes underway to correct them and to problems resulting from resisting this change. Even team members who were relatively new to the Institute – like Dan - recognized that many issues that the core team faced while designing the course reflected reactions to changes more than they did using participatory design,

There was already much change underway at the Institute when this project started that was not directly addressed during project framing or planning. This change was fueled in particular by the arrival of a new Academic Director with a mandate to implement a transition process that would improve the standards for instruction generally at the Institute. Accepting this change was particularly difficult for some departments that had previously implemented new processes to design and deliver courses that worked well for them but that no longer fit with the new standards. While there was no direct link between participatory design and these changes, they were important enough to influence how departments and individual instructors perceived the participatory design project and reacted to it. Although the change being introduced was identified early in the project as an important factor in the organizational context, I was not aware of any activities carried out during the project to plan for and manage that change. As a result, some of the reactions to change that affected this project were dealt with individually rather than through a well established change management process.

Because participatory design involves more people from different parts of an organization, it will likely be influenced by a broader range of factors not directly related to this methodology but that reflect instead the real preoccupations of participants and their organizations. Individuals, for example, who are affected by changes taking place around them may become distracted or more concerned about these changes than about participating in an instructional design process. They may become less motivated to participate than they would be otherwise or may not collaborate as openly or effectively as they could. Participatory design as a social process is therefore subject to the influences of many different formal and informal work processes, decisions, alliances, tensions or other human characteristics of organizations. Because of this, it becomes important to clearly distinguish between the problems that participatory design can help solve and those to be addressed otherwise, and dealing with them directly. This case study strongly suggests that doing participatory design would have been easier and more effective with more structured project management and better change management.

Third Ancillary Question: What Is The Effectiveness Of The Resulting Learning Program In Terms Of Achieving Its Intended Learning Objectives? Are There Larger Performance Issues?

The purpose of this project was to create the first in a series of courses to improve the quality of instruction at a learning institute. This first course on instructional skills focused more specifically on preparing and presenting effective classroom instruction. To confirm what was achieved, course design was followed by a pilot course to test the course content, the learning sequence, the effectiveness of instructional materials and

activities, the usefulness of practical exercises and of evaluation methods. The course was offered to a small class of current instructors, and to one potentially new instructor who together represented well the target population of new and experienced instructors. But because only a pilot was observed in this study rather than the impact of long-term use, only a partial answer to this question can be provided.

Based on first hand observations and feedback from participants, the results of the pilot course indicate that it was well designed and achieved its objectives. All of the students who attended the pilot agreed that the course effectively addressed their needs as instructors at the Institute or elsewhere in the Agency. They believed that the course was well suited to the target audience, that it addressed a real need and that it would help improve the quality of their instruction. But they also made some suggestions to improve how practical exercises were carried out and to improve the course documents. More specifically, while they agreed that teaching some of the course content could be an effective way to practice using instructional skills, at least one student believed it detracted from focusing on learning about instructional skills by focusing instead on learning the course content. It remains to be seen, however, how this course may help improve the performance of the faculty generally at the Institute over time.

This study did not allow monitoring changes and potential performance improvements over time, nor did it allow investigating the potential impact of using a participatory design methodology on future instructional design projects at the Institute. More research is needed to study these questions and other potential effects of using participatory design for workplace learning.

Fourth Ancillary Question: What Type Of Change Management Issues Arise For Instructional Designers Who Are Experienced In Traditional ISD Methodologies?

This study did not specifically investigate how instructional designers who are experienced with using more traditional design models may react to using participatory design instead. At the same time, the data gathered during the study suggests that instructional designers who are familiar with more traditional models of instructional design may find using participatory design for workplace learning challenging in many ways. Peter was the only team member with some experience in instructional design, He had learned about ADDIE during his studies in education and had used similar models in previous design projects. More than once during our conversations, he commented about how using participatory design made him aware of the importance of being less directive and more inclusive when working with others to design something. He was particularly concerned about making – or appearing to make – important design decisions alone rather than helping create the conditions for other team members to equally participate in all design decisions. He wanted to avoid reverting to an approach where an instructional designer decides to become a better facilitator and integrator.

Experienced instructional designers will already be familiar with the basic concepts of instructional design, learning and instruction, but they may not be as familiar with the principles and characteristics of participatory design for workplace learning. For some, using participatory design will mean learning new principles and working with others rather than working alone. The results of this study suggest this means not only learning about participatory design and how to use it effectively, but also about team work, project management and using specific techniques like rapid prototyping and

iterative design. For example, because members of the core and extended teams did not collaborate well, creating and maintaining good team dynamics remained a difficult problem throughout the project. Core team members found ways to work together that included using an iterative process that combined individual and team work, and using a form of rapid prototyping to structure the course. Because participatory design relies on the input of team members to decide how best to tackle a design problem, it would not be appropriate for an instructional designer leading a project to decide for the team or stop it from using design tools and techniques that work well for them but that may not be familiar to the designer.

Instructional designers must expect having to assume different roles during participatory design than they might in other design projects. They may equally be design experts contributing their expertise during design discussions; project managers responsible for guiding the project and facilitating the design process; and project participants sharing ideas and collaborating with others to complete project tasks. Not all instructional designers will have the necessary experience and expertise to comfortably and competently assume these roles.

Instructional designers must also accept that because participatory design is a team effort, they cannot unilaterally decide and tell others what to do during design and how to do it. Participatory design is therefore not about telling the team what steps to follow to apply a model, but rather working with team members to find acceptable ways of tackling and resolving design problems. The instructional designer must expect some false starts or changes in direction as the team works through the process of understanding the problem and what can be done about it. This was the case when the

core team first decided to use a DACUM to identify instructor roles and responsibilities, then decided against it out of concern there would not be enough time for it, and reconsidered their decision again after realizing how helpful it would be to identify key instructional competencies for the course.

Some instructional designers may therefore find themselves facing the apparent paradox of playing a less important role as instructional designers – their area of specialty – while playing a greater one in less familiar areas – like managing projects, facilitating team work, using rapid prototyping, working with context and culture, or resolving problems or conflicts. It this study, for example, Peter's role as project manager was clearly important: all other members of the core team commented about how important it had been for them to be able to rely on someone to lead the project, interface with management and address various problems that surfaced along the way. Not all instructional designers will be comfortable with this change and some may consider participatory design too difficult or demanding to use for workplace learning.

Instructional designers wishing to use participatory design should therefore be prepared to assume potentially new roles and responsibilities that may be quite demanding. They may feel at times that they are less involved in instructional design and more involved in other areas, like project management. Since participation and collaboration are central to participatory design, instructional designers must be flexible and better able to integrate the ideas of others into their own views about what to design and how. They must also become more skilled at using different tools and techniques, like group discussion and rapid prototyping. Some may find participatory design richer

and more satisfying than more traditional instructional design while others may feel it introduces too many challenges to be comfortable.

Instructional designers who want to use participatory design for workplace learning may therefore need to develop a different way of seeing their role in a design team. For example,

- Being less the champions of a model, theory or approach and more integrators and adaptors of different ways to solve problems.
- Being less focused on their experience and expertise and more open to the experience and expertise of others.
- Being less focused on following a process and more focused on solving problems that matter to all participants.
- Being more open and adaptable to changes in situations and circumstances.
- Being less focused on finding and proposing answers and more focused on helping others find their own answers.
- Being less focused on being instructional designers and more focused on being problem solvers.

Although this fourth ancillary question addresses more specifically the change management issues instructional designers may face when using participatory design for workplace learning, this study suggests that other important change management issues must also be considered. A first one involves whether or not organizations actively encourage collaboration and empower employees to make design decisions. In this study, management supported collaboratively designing a course but may not have considered how it might clash with the existing organizational culture. Nothing that was observed in

this study suggests that using participatory design in one project changed the organizational culture and made it more collaborative. Organizations wishing to use participatory design may therefore need to first develop collaboration and participation as key organizational values before using participatory design.

A second issue involves the extent to which employees in an organization are willing to accept participatory design and the changes involved. In this study, members of the extended team continued to argue against designing a course internally regardless of how the project rationale was explained to them. This frustrated core team members who tried hard to convince them to join the project. In the end, members of the extended team maintained their position and seemed to adopt a culture of no that prevented more open dialogue between team members. Three change management issues help explain this reaction: in a short period of time between when Larry started at the Institute and when the project was launched, Institute instructors were asked to accept new instructional processes and standards, to use a new tool – the CMS – and to accept new instructional techniques training designed internally instead of attending similar courses externally. The results of this study therefore suggest a need to identify and address employee change management issues before introducing participatory design when possible.

Using participatory design for workplace learning may introduce a number of changes in an organization that must be identified and managed effectively. For this reason, one of the first steps to start a project using participatory design should be confirming how well the existing organizational culture will support using this approach, the type of change that may be needed and how best to manage it.

ANSWERING THE MAIN RESEARCH QUESTION: WITHIN THE CONTEXT OF A SPECIFIC WORKPLACE, HOW COULD PARTICIPATORY DESIGN BE USED TO DESIGN INSTRUCTION FOR WOKRPLACE LEARNING?

The comments received from the participants in this study about their experience using participatory design to create an instructional techniques course and the above answers to the ancillary questions suggest that participatory design can be used effectively to design learning activities that address the needs of those involved in the design process.

During my final interviews with them, I asked each participant in this study about using participatory design for this project and if they would consider using it again in other projects. I therefore prepared and asked each one three questions to explore their views on this. The first question asked them about their experience using participatory design in this project; the second one asked what specifically worked well or not so well in using participatory design for this project; and the third one asked how they would feel about using participatory design again in another project. All team members were very positive about using participatory design in their answers (a dominant pattern in the data). Robert, for example, made it clear he was convinced of the value of using this approach:

> "Hum, worth every minute of it. Yeah. Absolutely, I don't have to worry about what's been left out of [the course]. I won't have to review it as… well I'm certainly going to have to review but not as soon, you know. I think that we developed a really solid project, our product. So you know, you're going to take the time, you know pay me now, pay me later, right? I wasn't prepared for the

> backlash that we got, but I'm still absolutely convinced that at least for us, this is absolutely the right way to go on these [design projects]. And one of my big concerns has always been, like I said, that narrow focus where one person is developing… doing most of the work and developing. It's not getting reviewed by others. You can miss too much and you get one person's interpretation of all this stuff. And I'm very much in favor of, you know you can have other people review it later, make a bunch of changes but I think the idea of getting all the people together and the discussion that goes on around the table is very good. And I think that we're all the better off for it, this process."

When asked if he would consider using participatory design again, his answer was unequivocal: "it's the only way to go".

Dan was equally pleased with using participatory design even though he remained concerned about having enough time to complete related activities: "See for me I thought it worked great. The only downfall is, for participatory design, you know you obviously have to find a common time for everybody to meet and that's just been by far, by far our biggest hurdle." For his part, Ernie explained that,

> "I think that participatory design worked very well . I think that the design was really done by a team which makes it difficult to question because many different points of view were expressed during design. It's always possible that we might have forgotten something but that shouldn't be the case. It's also why we wanted to have people from each department involved in this because each department works a bit differently and therefore teaches differently. Learning to use a radio is not the same as learning to fix a motor. That's why we needed people from all

over. Because there were often specific things to consider for inclusion in the instructional techniques course."

Rick added the following comment: "I think it's the best way to… as far as any project I think the best approach is kind of sitting down as a group and getting a bunch of different views as opposed to one or two people."

The comments received from the participants in this study make it clear they believed participatory design can be used to design instruction for workplace learning. Larry's comments also suggest that the Institute as an organization involved in workplace learning saw in participatory design an opportunity to create rapprochement and improve collaboration between departments. At the same time, because it was not possible to interview the members of the extended team, I could not confirm their opinion of using participatory design for workplace learning.

This does not imply, however, that participatory design should replace other models and become the principal approach used to design workplace learning. Instead, it may be more useful to consider participatory design as an additional set of tools in the instructional designer's tool kit that can be very effective and beneficial under the right circumstances.

In some ways, participatory design may require more structure than other design projects. Small projects or projects that can be completed by one or a few individuals may not require much structure. Because participatory design is a team effort, because more people are involved (more participants from different departments, more sponsors and stakeholders) and because team members will have different experience or expertise, it is important to structure participatory design to help all concerned understand what to

do and how to go about it. Structure would also help reassure management and naysayers that participatory design is not a feel-good exercise but instead a serious and well thought out methodology leading to measurable outcomes. This is especially important because not all organizations may be as interested in using participatory design as was the Institute, so that management generally may need additional reassurance about using participatory design before accepting it.

The decision to use participatory design or not may therefore reflect more the demands it makes on the organization and its resources than on the value of collaboratively designing learning activities that directly matter to those involved. Using participatory design, for example, may imply allocating more resources to a project, taking more time to complete the project, accepting higher project costs or sharing the responsibility for making decisions. Not all managers will see how the benefits of participatory design can outweigh the demands it makes on the organization, and may therefore not readily accept using it instead of another method they may know and understand better.

Participatory design may also not be suited for instructional design in highly competitive organizations, for example, that value and reward individual achievement more than team work. It may not meet the needs of organizations that must change rapidly to keep up with their environments or may be too slow to accommodate that level of change. What opportunities may exist to use participatory design for workplace learning may therefore be determined more by the prevailing organizational context and culture than by the potential benefits of using this method instead of another.

At the same time, participatory design offers a concrete example of how social interaction can be used productively in organizations. At a time when social networking, social interaction, collaboration and other social processes are gaining in importance in the workplace, participatory design becomes a valuable example of what can be achieved when people are encouraged to work together. Participants in this study made it clear they believed that working together helped improved the quality of discussions about the course and their design decisions. Organizations wishing to make more use of social interaction to improve both how they work and what they achieve may therefore find that participatory design fits their context better than do more traditional instructional design methods. At the same time, organizations that are less interested or concerned about social interaction at work may find participatory design too slow or cumbersome to be used effectively.

Two specific frameworks offer insights into the effective implementation of participatory design: project management and participatory design as a social process.

Project Management and Participatory Design

Project management is fundamental to successfully using this methodology. I discuss in particular the need to,

- Ensure full participation and management support.
- Specify and manage time and effort.
- Resolve conflicts.
- Provide essential tools and equipment.
- Use prototyping.

- Follow an iterative process.

Project management can be defined as the application of a body of knowledge, skills, tools and techniques to project activities to meet project requirements. The Project Management Institute (2008) states that,

> "In addition to the five project management processes of initiating, planning, executing, monitoring and controlling, and closing the project, effective project management requires knowledge of the characteristics of the project's environment (e.g. technology, industry, etc) as well as general management knowledge and skills, and interpersonal skills."

Anecdotal evidence further suggests that projects for developing instruction, particularly in educational settings, are often challenged by limited staff, funding constraints and quick turnaround times (Williams van Rooij, 2009, 2011). Tough economic times over the past few years have further contributed to reducing the size of typical projects so that many instructional design projects are now smaller, more focused and less heavily funded. Small projects are characterized by a duration of less than 6 months, fewer than 10 team members, a small number of skill areas, a single objective and a readily achievable solution, straightforward deliverables and a budget of $75 000 or less (Rowe, 2007).

Data from this case study shows that the Institute considered this participatory design work as a project with similar characteristics as those identified above. For example, a memorandum that circulated early in the study stated that designing an instructional techniques course would be carried out as a project and that Peter would be the project manager. The memorandum further identified a need to assign a team to the

project and the project was initially given a deadline of December 2010 to achieve its objectives. The project reflected a single overriding objective - to design and deliver a course on instructional techniques for new and existing instructors. The project did not receive separate funding and it was clear to all involved that the time and budget available for it would not allow developing complementary learning activities, like adding e-learning modules to cover some topics. Peter was given the responsibility to manage the project early on and remained officially responsible for reporting to management about it and communicating management wishes and directives back to the team.

A number of issues surfaced during the project that were more about project management than about participatory design, including handling participation issues and dealing with reluctant departments, and resolving work scheduling problems so team members could regularly participate in the project.

Peter in particular clearly had two roles during the project: first, he managed the project and took action to ensure it was completed as planned; and second, he contributed to the team's discussions about designing the course and therefore to the participatory design process. Although there was no formal separation of these roles during the project, all other team members recognized that Peter was both the project manager and a participant in the design process. Core team members unanimously agreed they might not have been able to complete the project without an effective project manager. This was a dominant pattern in the data.

Team members therefore relied on Peter to work with management and provide some direction as needed. They also relied on Peter to take care of any formal project

reporting. They did not, however, share his project management responsibilities and no other team member was ever considered the project manager. There was no discussion between Peter and the team, or between the team and management about sharing project management responsibilities.

That all changed when Peter became ill. Core team members did step in to complete the design phase of the project when Peter was ill, but that was not planned and did not reflect a formal arrangement with management. It reflected instead the willingness of team members to temporarily take over from Peter during his medical leave to complete the project and not leave things unfinished. Their comments indicate being primarily motivated by not wanting to 'let Peter down' rather than wanting to manage the project. In other words, even in his absence, Peter continued to lead the team.

Although project management was an integral part of how participatory design took place in this study, it was not as formal or as structured as recommended in the literature or by experts on project management. For example, there was no formal project plan and three of the five project management processes recommended by the Project Management Institute (Initiating, Planning and Closing) were either changed in some ways or condensed. Although there was an initial meeting with the core team, it did not include stakeholders or other faculty members and there was no formal discussion with all those concerned about the project mandate, deadlines and milestones, structure or team roles and responsibilities. The process of closing the project was also condensed and did not include a formal last meeting with team members and stakeholders to review and discuss the project and its outcomes. The recommended project management processes of monitoring and controlling were, however, more closely followed than other processes.

Observations made during this case study suggest that project management played an important role in this project to guide the team's effort, maintain a productive working relationship with management and within the team, and address problems that surfaced along the way. At the same time, some problems may have been avoided or better controlled if the project had followed all recommended project management processes. In particular, openly discussing the purpose of the project and the team's mandate during a kick-off meeting with all stakeholders and participants might have helped address some of the problems or conflicts that surfaced later, and help confirm which tools, equipment or support would be available to the team.

The core team, however, did use prototyping and follow an iterative process as recommended by the project management literature. Prototyping was used throughout the project to facilitate discussions between team members and try out ideas. Although team members did not create and prototype actual lessons under real conditions, they used other techniques to confirm what to include in the course. For example, they used stories about their experiences as instructors and about what they observed in other instructors at the Institute to create a shared mental model of what to do and how best to do it. They also created prototypes of course documents – like session plans - to help focus and support team discussions.

With respect to following an iterative process, the core team agreed early on to,

- Identify together the design problems to tackle.
- Determine the order in which to tackle design problems.
- Select a problem or issue and individually prepare for discussions about it.

- Share their work with other team members during regular project meetings, discuss options and co-decide how to proceed.
- Select the next design problem and repeat the cycle.

Team members unanimously agreed that this cycle helped them stay focused and productive, and meet the project deadlines.

Participatory Design as a Social Process

The second framework to use when considering participatory design for workplace learning is that of participatory design as a social process based on collaboration and cooperation.

Using participatory design for workplace learning requires integrating broader principles of collaboration and social interaction into effective project management practices. Within this framework, teamwork becomes the essential vehicle through which participatory design is applied (Figure 5). In other words, project management becomes the essential framework for using participatory design in the workplace, and team work the tool to apply this methodology.

Figure 5: Hierarchy of Principles and Practices for Participatory Design

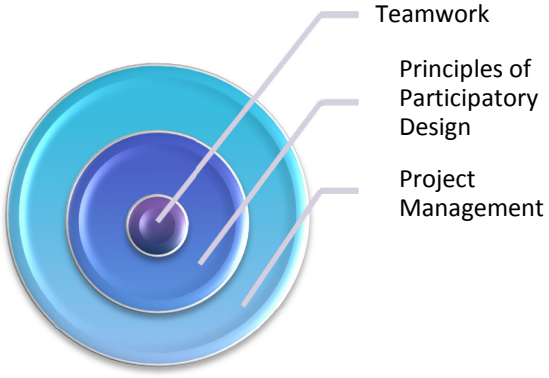


Figure 5 represents well what happened during this study with the core team but not so well how extended team members were involved in the project. Core team members worked well together, agreed to follow the principles of participatory design introduced early in the project and acknowledged Peter's role as project manager. Perhaps because Peter, William and Robert knew each other and had worked together before, and because Dan and Rick also worked together it was easier for them to find common ground and informally come together as a team. Core team members were also individually motivated to participate in the project and shared that motivation. This was not the case for extended team members who resisted the project and the changes it represented, were not individually motivated to participate and did not try coming together as a team. Personal points of view about the project may therefore have influenced team member behavior more than group processes: core team members were first individually motivated to participate and more willing to work with others. Extended team members were not motivated to participate and did not seem willing to work with anyone else, including others who shared their opinions.

The results of this study suggest that individual motivation to participate and work with others is fundamental to successfully using participatory design. It would be wrong, however, to assume that potential participants will always be personally motivated to participate in this type of project. In this case study, for example, members of the extended team were clearly not personally motivated enough to overcome their objections to the project. To benefit from greater collaboration and social interaction

during participatory design, organizations may first need to help create a climate this is conducive to participation and collaboration and that motivates individuals to become involved in instructional design. . This need to motivate and re-motivate participants throughout a participatory design project is consistent with the experience from other participatory design projects reported in the literature (Pilemalm and Timpka, 2007). Without this individual motivation, participants may not support a participatory design project and work against it instead as did the members of the extended team. Individual motivation is therefore fundamental to implementing participation and collaboration and developing effective social processes.

A PROPOSED MODEL FOR USING PARTICIPATORY DESIGN IN WORKPLACE LEARNING

In the first part of this chapter, I reviewed and answered the main question that guided this study, and its four ancillary questions. In doing so, I found that the results of this study generally agree with the literature on participatory design about the importance of following fundamental principles. Two sets of principles stand out: first, those underscoring the importance of following good project management practices to organize and structure participatory design for workplace learning and second those linked to the need for extensive and effective collaboration in the process.

In this section, I present a proposed a model of participatory design for workplace learning that shows how these principles can be applied. Because the model primarily reflects a single case, because the proposed phases and activities have not been confirmed

through other research, and because the model seeks to explain what may be involved in using participatory design for workplace learning, it is considered a descriptive and not a prescriptive model. It therefore explores both how to optimize participation and collaboration during design, and how to structure and manage related activities to achieve important outcomes. In the following paragraphs, I first describe the broad steps of the model and then discuss specific activities for each step.

The model reflects these foundational concepts:

- Instructional design can be strengthened through broader participation and collaboration. Participatory design can strengthen the process of designing learning activities for the workplace by providing an opportunity for those directly impacted by a problem to help solve it. This model therefore accepts that social interaction leads to more creative problem solving based on a shared understanding of what constitutes a problem and effective solutions.
- Understanding context is as important as understanding the specifics of a design problem. Instructional design problems in the workplace cannot be properly understood when separated from their context. Participatory design as a social process is directly influenced by context, and contextual factors must be allowed to influence the participatory design process. The proposed relationship between participatory design and context is akin to that of foreground and background: each helps define the other and is best understood when viewed against the other.
- Instructional design in the workplace and participatory design in particular are more effective when carried out as well defined projects, with clearly stated objectives, activities, contributors and outcomes. Participatory design is

undertaken to resolve a problem linked to workplace learning. A problem is any question or matter involving doubt, uncertainty or difficulty, requiring a solution in the form of satisfactory change or improvement. Productive activity undertaken in the workplace to solve problems often takes the form of a project, which can be defined as the application of a body of knowledge, skills, tools and techniques to project activities to meet stated requirements.

- Projects must be managed effectively to achieve expected outcomes. Effective participatory design for workplace learning therefore requires some effort to ensure that design activities are well planned, organized and carried out, to communicate better with stakeholders, management and other parts of the organization, and to better support the participatory design team. Although ISD includes clearly defined phases and outcomes for each phase, it often does not take into account the influence of practical issues and how to address them. For example, ISD recognizes the importance of starting the design process with a thorough needs assessment but this is often not done or else not as recommended because there is no time, because eventual learners can't be reached or because management has already decided what is needed. Rather than assuming that following phases alone will provide the necessary project structure, this model specifies that project management is an essential part of using participatory design for workplace learning.

Project management organizes participatory design and provides direction to achieve desired outcomes. Because standard project management processes have already been defined that have become accepted in the workplace, this model adapts the five

phases (or process groups) of project management (PMBOK, 2008) into five phases of participatory design for workplace learning, and then explores what is more specific to participatory design. Table 5 identifies and briefly summarizes the purpose of each phase and their application to participatory design.

Table 5: Application of Project Management to a Participatory Design Project

Project Management		Application of Project Management to a Participatory Design Project	
Phases	**Definition**	**Phases**	**Definition**
Initiating	Define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.	Initiating	Define the problem at hand and how workplace learning may help solve it. Identify stakeholders and participants and determine the need for participatory design. Investigate contextual conditions and constraints. Obtain stakeholder and participant commitment to use participatory design.
Planning	Establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.	Engaging	Scope the project, refine project objectives and develop a project plan. Review the purpose and process of participatory design and how it should take place with stakeholders. Review and confirm the role of the design team, and expected team member contribution. Recruit, select and orient team members to the project.
Executing	Complete the work defined in the project management plan to satisfy the project specifications.	Designing	*This is the phase during which participatory design takes place*. Team members collaboratively design what they will use to acquire new knowledge and skills. Working together, team members decide how to proceed and complete the design process.
Monitoring and Controlling	Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.	Trialing	Those processes required to track, review, and regulate the progress and performance of the project. In particular, validate the design through trialing and pilot testing. Identify problems with the course design and make necessary changes and improvements.
Closing	Those processes performed to finalize all activities across all phases to formally close the project.	Closing	Review and finalize all project activities. Submit a project report, review and confirm outcomes with stakeholders. Review the participatory design process and identify opportunities for improvement. Review the project with team members and release them from the project.

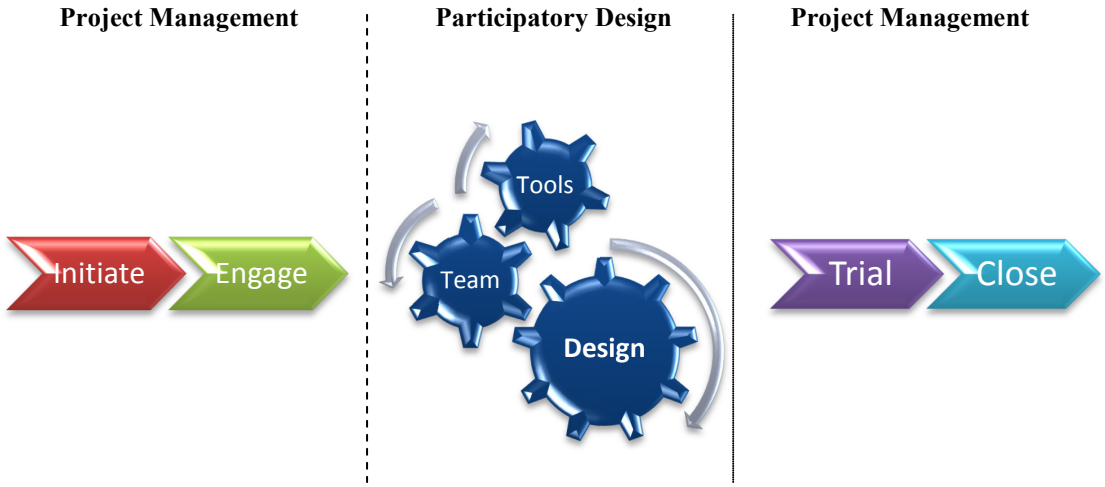
It should be noted that although the steps presented in that table may seem to reflect those of more traditional instructional design models, the structure of the model

presented here emphasizes the integration of project management and participatory design instead of those to that apply specifically to designing instruction. Because this model assumes that project management provides an essential framework for using participatory design, it follows the same or similar steps as those proposed to manage projects generally. The steps of this model therefore reflects applying project management principles to best support participatory design for workplace learning.

Participatory design occurs more specifically during the third phase (Designing) and does not require following a strict sequence of activities during. Instead, team members decide themselves what to do and how best to do it. As was the case in this study, a team may decide to use an activity, like a DACUM, change its mind and opt against it and then return to it later. The steps the core team followed during the design phase were those of an iterative process they adopted to integrate individual and team work instead of those of a known instructional design process.

Figure 6 clarifies how project management and participatory design are integrated together. Following the steps of project management help start and end a project, and maintain positive progress throughout. Participatory design occurs within this framework but does not rely on following a prescribed series of steps. Instead, participatory design is an open and flexible process that may take different forms depending on the project and its participants. Participatory design in this model is an open and iterative process that occurs within a more formal project management framework that supports this work.

Figure 6: Project Management and Participatory Design



The next sections of this chapter further discuss the proposed activities for each phase of this model of participatory design for workplace learning.

Phase 1: Initiating

Like its counterpart in project management, the first phase of this model focuses on confirming what should be done and why. This phase is therefore concerned with clearly defining the problem at hand and the role of workplace learning to resolve it. It then reviews what participatory design is with key stakeholders and participants, and co-deciding if and how it can be used for the problem at hand. It is concerned with ensuring that all involved understand what is participatory design, how it works, what are its benefits and drawbacks and getting the necessary commitment to proceed. Instructional designers involved in this phase should, as a rule of thumb, assume little and learn much. Accordingly, Phase 1 is not only about defining the project but also about deciding if

participatory design is appropriate to help solve the problem at hand and if existing conditions will allow it.

This model assumes that the instructional designer responsible for a project involving participatory design will also often manage that project. The instructional designer will therefore typically handle two roles, as was the case in my study: of project manager and of participant in the participatory design process. During Phase 1, the instructional designer's primarily role will be that of project manager responsible for ensuring the project is worthwhile, feasible and supported by key stakeholders and participants. The project manager must determine as best as possible,

- What is the problem to be solved.
- The extent to which the problem involves human performance and can be solved fully or partly through workplace learning.
- Who is concerned with the problem, and why.
- What constitutes an effective solution to the problem and what are the sponsor and stakeholder expectations.
- The conditions or constraints that will likely affect the project and how they may influence using participatory design.
- The resources that can be allocated to the project and whether or not those for whom the training is intended will be available to actively participate in the design process.
- How well the organization supports using social processes to help solve problems and improve how the organization works.

Phase 1 of this model is therefore characterized by gathering and analyzing information to confirm what the project is about, and in particular that participatory design is appropriate for the type of problem identified and for the organizational context. Although other instructional design models also start by gathering and analyzing information, most assume using a known instructional design methodology rather than confirming which is most appropriate for the situation and circumstances. The model therefore does not assume that participatory design will be the best methodology for effective workplace learning but specifically states instead the need to confirm if and how it can be used. Some of the criteria to guide deciding about using participatory design include that,

- The organization has some history of using projects and team work effectively. In this study, the Institute regularly used projects to complete particular mandates. Every member of the core team, for example, mentioned at least one other project in which he was involved either before or during this one. At the same time, I was not aware that the Institute followed any particular project management methodology or specific principles for team work. As Larry explained during our first interview, the nature of the operational work carried out regionally often requires employees to work closely together and depend on each other. Because most instructors at the Institute are recruited from operations, management may have assumed that team work would occur as naturally there as it does in operations. That, however, was not the case and it was not possible during this project to achieve the same level of cooperation between the two teams as it was between members of the core team. The results of this study therefore support the

need to have good project management and team work practices in place for participatory design.

- The organizational culture accepts the role of human social interaction in problem solving and encourages employee involvement. This was not necessarily the case in this study. Although Larry clearly wanted instructors from different departments to collaborate on this project, gave directives to this effect and communicated openly with the core team, it was not possible to achieve true collaboration between the two teams. This situation underlines a potential conflict in organizations that may want to make better use of social interaction for problem solving without having the structure or culture in place to support it. In this study for example, Larry tried diligently to introduce using social processes at the Institute but had to contend with an organizational structure that followed a top-down management model – and with which he was most familiar - and an organizational culture that did not yet recognize the value of ongoing collaboration.
- The level of activity in the organization and individual workloads allow time to participate regularly and effectively throughout the project. Finding time to attend meetings and complete other project tasks remained a challenge for most of the participants on this project.
- The project timelines allow for team work and participating in the design process.
- Managers and stakeholders understand what participatory design is and agree to use it.

This phase also emphasizes the critical importance of identifying all relevant contextual factors and assessing their impact on using participatory design. The decision to use participatory design – or not - should therefore be made after gaining a better understanding of the context and its expected effects on the project. The context of a project does not necessarily change its overall structure but often determines how problems are defined, the emotional responses they illicit, the range of solutions that may be considered and how they may be implemented. Context may dictate how best to approach project stakeholders and participants and discuss issues. When investigating context, instructional designers should look for patterns, sources of formal and informal authority and influence, what constitutes expected or unacceptable behavior, relationships between groups and individuals or existing work processes and their rationale.

Interviews, focus groups, observations can all be used to meet stakeholders and participants, learn about their concerns and better understand how things actually work. These techniques allow socially constructing meaning about problems and solutions, help build essential interpersonal relationships for participatory design and force considering emotions and other human attributes and not only the facts about events and activities (Merriam, 2002).

Project managers must expect pressure to quickly complete Phase 1 and start the design process. Because of this pressure, the activities of Phase 1 may have to be rolled into those of Phase 2 to get the time needed to complete the analysis while starting project planning. Under optimal conditions, the project manager will be able to complete Phase 1, recommend follow up action and discuss implications with stakeholders before

starting Phase 2. But s/he must also expect having to adjust the phases of this model to adapt to actual conditions and constraints, and to organizational demands.

During this first phase to initiate the project, the main role of the instructional designer will be managing the project and getting it underway. The instructional designer's role of participant will not be as prominent during this phase as it will become later because the project team won't yet be in place and because design activities will not have started.

Phase 2: Engaging

Phase 1 of this model focuses on clearly identifying the problem to solve and confirming it can be solved at least partly through learning, that the participatory design methodology can be used effectively, that the organization understands what using participatory design involves and supports using it. Like its counterpart in project management, Phase 2 of this model focuses on planning the project to confirm its scope, refine the objectives and define a course of action to achieve them. But Phase 2 in this model is also concerned with setting up an effective project team and getting them ready to collaboratively design learning activities that will meet their needs.

As in Phase 1, the instructional designer's most prominent role during Phase 2 is managing the project. As project manager, the instructional designer must work with the project sponsor and other stakeholders to define the project and its activities, arrange them it into an effective sequence, identify and allocate necessary resources, and confirm deadlines and expected outcomes.

Identifying and allocating necessary resources during planning also involves setting up and orienting the project team. This part of Phase 2 is critical because successfully using participatory design depends largely on how well a group of people are motivated to work together as a team to co-design learning solutions. In this study, for example, members of the core team volunteered for the project and were eager to participate, but members of the extended team did not volunteer and were instead nominated to represent their departments. Perhaps because of this, members of the core team worked better together and contributed more to the project than did the members of the extended team. Core team members were also able to overcome some of the obstacles created by the extended team. As noted earlier, participatory design projects that don't recruit motivated participants may therefore not succeed.

Core team members appreciated the importance of being a good team and working well together. At least one of them had also previously experienced the importance of assembling a good team for a project. Because I had heard from other team members that Robert had led a successful project just before this one, I wanted to explore that experience with him during our first interview. When I asked what factors had in his opinion contributed the most to that project's success, he immediately answered "I think the team work had a lot to do with it." He explained that he decided early in the project to work more closely with others and assembled a team:

> "I got largely to pick my own team members. I brought in some people from outside with a lot of good operational experience, and then people like Peter with his educational background, and got help from others. There were certain people who I've worked with before, whom I have a lot of respect for, and I value their

> opinion. And the one fellow, William, when I first started off I wanted him but couldn't get him. They wouldn't release him from operations because he'd just come from an assignment in Ottawa and they needed him back in operations. But he injured himself and became available, and I guess we're benefiting from that. And then I picked some people from other regions that I either knew, or one fellow I heard a lot about and I really wanted to get him involved from B.C., and I managed to pull some strings to get him on board for a while too, so this is the way that we did it.

When I asked as a follow up question if it was "fair to say that you started thinking about people that might have the expertise to contribute to the project?", Robert replied "Yeah, the subject matter expertise. And not only that, but also the people that I could really work with, you know."

This model proposes following four steps to assemble the team: recruit, select, orient and confirm, as presented in Figure 7. The steps to assemble a team are represented as a cycle that may be repeated until a complete team is assembled. Some individuals, for example, may not have the necessary attributes to participate or others may discover during orientation that they would rather not participate in the project.

Figure 7: Team Selection Process

The first step to recruit potential team members focuses on communicating the purpose and objectives of the project to create interest and motivate individuals from a target population to join the project team. In participatory design, the target population from which to recruit participants is the group of individuals for whom workplace learning is being designed. Because this model seeks to attract voluntary participation, it is important that an organization demonstrate early on its support for the project: that it matters to senior management and that participation is essential. In this study, Peter worked closely with Larry who actively supported the project and intervened as needed to help the core team overcome obstacles. William also made it clear during our conversations that Larry played a key role providing direction and helping solve problems. Because of the pressure that was applied by the members of the extended team and by some department heads to find other ways to train instructors than designing a new instructional techniques course, it may not have been possible to complete the project without ongoing management support.

Recruiting qualified participants is easier and more effective when a project sponsor from senior management directly communicates with employees to request their participation. That communication should indicate which participants are sought and how team members will be selected.

The project manager should not select team members alone but work instead with a few others familiar with the target population and who have a stake in the project. For

example, a selection committee could include managers, union representatives and personnel specialists. Interested candidates should be able to ask questions about the project and confirm their interest before meeting with the selection committee. Recruitment and selection must remain open and transparent to reinforce the need to collaborate and work well together. It is also important to inform other parts of the organization about the project and the participatory design process, and get their support as needed. This can help identify and deal early on with problems that may otherwise affect the project later, as was the case in my study.

The selection committee should focus on identifying people,

- Directly affected by what will be designed.
- With sufficient experience and expertise to actively contribute to discussions and decisions.
- Genuinely interested in being part of participatory design methodology.
- With a good track record of working with others and being a valued team member.
- Willing to work with other team members selected for the project.

The next step after selecting team members is for the project manager to lead a first, unofficial meeting with the team to orient them to the project. This activity involves discussing project and team responsibilities in more detail, but not actually starting design. The purpose of the meeting is instead to bring participants together as a team to review and discuss the project, and confirm the team's commitment to participatory design. It is part of starting the team building process. The meeting should therefore discuss what the team is expected to do, what constitutes effective team work for

participatory design and how to tackle and resolve problems that may arise. The project manager must then clarify his role and responsibilities and how s/he will work with the team. When the project manager is also the instructional designer, both roles should be explained and how they will manifest themselves during the project. By the end of the meeting, team members should be satisfied that they understand the purpose of the project, how they are asked to contribute to it, how they will work together and the conditions under which to complete the project. In this study, Peter and I shared the responsibility for preparing and leading this meeting: Peter reviewed the project mandate and expected outcomes while I reviewed the project methodology and respective roles and responsibilities.

As was the case in this study, not all of those invited to participate in the project may agree to do so. It is therefore particularly important during this project phase to encourage and allow open discussion about the project and participating in it. Participants should be allowed to withdraw from the project without consequences if they decide not to participate. Their objections to the project or else the reasons not to participate should be carefully reviewed to identify and address any important issue that could impact the project. Those who can't or don't wish to participate regularly should be offered other means of contributing opinions and ideas when possible, for example by discussing them privately with the project manager.

Team members who agree to continue with the project should be officially identified to the organization and welcomed to the project. Necessary arrangements should be made with their supervisors to ensure their availability and participation. This was not always the case in this study, even though time to participate on the project was

formally requested. As a result, it remained difficult throughout the project for team members to manage their busy schedules and find time to participate. All core team members struggled with this and made it clear that finding time for the project was difficult. With respect to identifying team members to the organization, members of the core team were officially identified to the organization but not necessarily those from the extended team, perhaps because that team's composition changed a few times during the project. If all team members had been clearly identified to the organization and their roles and responsibilities explained, members of extended team might have viewed their role in the project differently and participated more openly.

In this study on participatory design for workplace learning, core team members were all volunteers who were motivated to participate. But members of the extended team were often appointed to represent their departments and did not share the same degree of interest and motivation for the project. Team members therefore did not all invest the same amount of time and effort to complete project tasks. Being willing to volunteer for a project, however, is not the only factor to consider when recruiting team members. In some cases, individuals who are genuinely interested in a project may not be open to team work or able to contribute essential expertise. Because it was important to recruit instructors needing instructional skills training for this study, it would not have been appropriate to recruit experienced instructional designers instead even if they were motivated to participate.

Although the team recruitment process should encourage voluntary participation, final decisions about team composition must also consider what is best for the project and what will be supported by management. In some cases, for example, management may

require some individuals to participate instead of others. Finalizing the team may therefore involve much discussion and compromise, which may at times seem to contradict the principles of participatory design. Compromise, however, may also be essential to complete the project and meet stakeholder expectations.

By the end of Phase 2, the project manager should have an approved project plan in hand and a team of motivated individuals ready to implement it. Team members should understand their roles and responsibilities in the project, what is participatory design and how they will work together to use this methodology. They should understand the importance of participation and collaboration and be willing to work openly and actively together. Those not wishing to participate should have been replaced without consequence and still be able to contribute when possible. They should be ready to start designing effective learning solutions to address a problem that matters to them.

Phase 3: Designing

After planning the project and setting up the project team, Phase 3 of this model of participatory design for workplace learning focuses directly on designing and developing relevant learning activities. This phase is therefore at the heart of participatory design per se, where individuals work together and collaborate to resolve problems that may be addressed through workplace learning. It corresponds to the Executing phase of project management and is therefore also concerned with completing the work defined in the project management plan to satisfy the project specifications.

Because all participants might not be familiar or comfortable with instructional design when they first join the team, this phase starts by reviewing concepts with the

team like building a basic familiarity with participatory instructional design, building a shared understanding of the problem to be addressed.

Building a Basic Familiarity with Participatory Instructional Design

Participatory instructional design involves bringing together individuals who are directly affected by a problem and who wish to participate in designing learning activities to help solve it. Team members are expected to be interested in the project, motivated to participate and able to contribute relevant experience and expertise. They are not expected, however, to be experienced instructional designers. As a result, Phase 3 should start by reviewing basic concepts of design for workplace learning as essential background to understand what to do and how best to do it as well as the principles of participatory design.

A key part of this activity is intended to familiarize participants with the instructional design part of the challenge. The purpose of this activity is not to train new instructional designers but only to provide background that will help team members work better. Detailed discussions on instructional design models, processes and steps, learning theory, design theory, systems thinking and other similar topics are neither necessary nor useful. Concepts should be introduced from a practical perspective: for example, discussing performance improvement not only as a design principle but also in terms of how their own performance should improve after taking the training they will design.

When team members will use specific tools to prepare learning documents or materials, like the CMS in this study, these tools should be introduced and their use explained. The discussion should therefore help participants understand where the design

process starts and ends, what tools can be used, what deliverables to prepare, and how best to contribute their expertise, participate and collaborate together.

The purpose of such an introductory session on instructional design was learned through the experience of this study. The process followed in my study initially did not include a formal session to review these concepts with team members. But they eventually requested one and in response, I led a one hour session during which we reviewed basic design principles and concepts, discussed issues and answered questions, and developed a common understanding of the task ahead. The session was especially useful to team members like William who was not at all familiar with instructional design and felt overwhelmed at times even with the terminology used. Other team members shared their views and experience with William, and helped him better understand how things should work and how he could contribute. The session therefore also became an opportunity for team members to start collaborating and helping each other.

Building a Shared Mental Model of the Problem to Be Addressed

Because team members will likely have different points of view about what constitutes the problem to solve through participatory design when they first join the team, the next step of this phase is confirming that all participants share a common understanding of the problem and possible solutions.

Developing a shared understanding of a problem essentially means developing a shared mental model. A mental model is a set of ideas or ways of thinking about some part of reality. It can be seen as an explanation of someone's thought process about how things work in the real world (Wikipedia, 2011). Mental models therefore reflect an

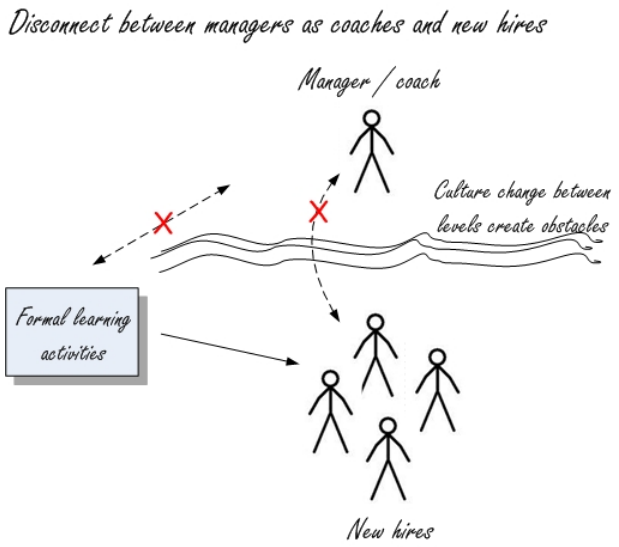
understanding of reality without delving into all possible detail. Because the cornerstone of participatory design is people co-creating solutions to problems involving learning, the team must develop a shared mental model of the problem to effectively tackle it together. Otherwise, they will be working together to solve different problems.

Building shared mental models involves discussing ideas and opinions about all that is associated with a problem. Different techniques can be used to stimulate discussions towards building a shared mental model, but two of them stand out in particular: using drawings and storytelling.

Mental models are often easier to develop using drawings that illustrate the elements of a situation or problem and their interaction (Houts et al, 2006; Gutierrez, 2005). Using drawings encourages people to see a situation as a whole and avoids getting too quickly into detailed discussion. Similar techniques have been used in other participatory design projects. For example, PICTIVE (Plastic Interface for Collaborative Technology Initiatives Through Video Exploration) is a technique developed in the early 1990's in which participants draw pictures or otherwise illustrate what they are designing to facilitate communication between team members (Pilemalm and Timpka, 2007; Muller, 1992; Technopedia, 2012).

Basic line drawings are often enough for discussion, and drawings should, as a rule, be kept simple like the sample in Figure 8. They can include words to label, identify or otherwise clarify illustrations, but words should not dominate the resulting picture.

Figure 8: Sharing Mental Models



As a way of conveying ideas, describing events or explaining something in a more personal and engaging fashion, storytelling can be used alone or with drawings to help create shared mental models, as was used in the design process in this case. Stories are typically more personal than other forms of communication, coming to life through characters and the events affecting them. Because people often relate more easily to a story involving other people, situations or events they know and understand, stories are powerful tools to develop relationships by helping people realize what they have in common. They also express underlying values and beliefs that should be recognized, discussed and perhaps confronted to develop common agreements, or avoid conflict (Denning, 2006; Adamson *et al*, 2006).

In this study on participatory design, team members often used stories to explain a point of view or share information. They used them naturally and without prompting, to more clearly express their opinions or ideas. For example, when the team had trouble understanding an instructor competency, Robert spontaneously told a story in which he faced a problem in class as an instructor that he resolved by applying that competency. William and Peter, who were co-instructors on that course, remembered the situation well and helped clarify Robert's story. Dan, Rick and Ernie, who were not involved in this course, asked questions and then added elements from their own experience or from what they observed in other instructors to further define and explain the competency. Through storytelling, the team was able to more quickly reach a common understanding of what they were discussing. Using stories was never discussed with the team or consciously encouraged, but happened spontaneously as a natural way of communicating something with more personal meaning.

Stories can be oriented towards imagining better outcomes or ways of doing things. Once individuals dare to imagine, elements of real solutions can be identified and integrated into positive action. It is important, however, to ensure that storytelling is a channel for productive group discussion and doesn't become idle chat. Sharing stories can be time consuming and perceived by some as wasted time unless it clearly helps with the discussion. They must therefore be relevant to the project and the task at hand. Stories can also be used to get 'unstuck' by identifying obstacles and ways to overcome them. They should be told in positive tones that encourage thinking beyond what is recounted to better identify lessons learned or other helpful elements.

To facilitate using storytelling, it should be remembered that,

- There is no best way of telling or using stories. What matters instead is that the story be relevant to the person telling it and to those listening to it. Participants in this study were not told to use stories or how to use them. Instead, they shared stories from their experience that came to mind and that they believed would illustrate a problem or its solution. What made a story relevant was how well it connected to the experience of others: Robert, for example, told stories of events that were familiar to William and Peter and that they could complete as needed. Dan and Rick shared stories of their work in the academic program to illustrate the differences between the instructors there and those in the professional development program. Perhaps because he was still a new instructor at the Institute, Ernie did not share as many stories with his colleagues, although he shared some with me during our interviews to further explain his comments.
- Stories are a tool to be used judiciously. While stories help the participatory design process, they are not participatory design per say. In this study, core team members used stories but did not rely on them to design the course: telling stories was never formally identified as a project task of technique.
- Stories must be appropriate and recounted tastefully. During this study, it became obvious that core team members exercised some control over how they used stories. They reminded each other when it was time to move on after using a story to discuss a design issue. They also spontaneously changed the stories as needed to respect confidentiality. Stories were therefore “about someone that got in big trouble last year” instead of being about specific people or events. Doing this

helped keep stories focused on illustrating design problems and their solutions instead of commenting on the people and events at the Institute.

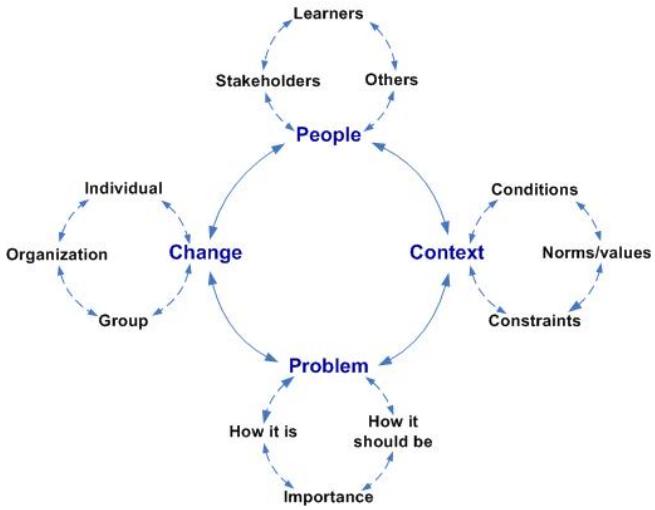
- Stories and the discussions around them should be summarized to identify key ideas or lessons learned. In this study, stories were not recorded verbatim. Instead, the main or most important ideas from each story were added to other information used during meetings to make design decisions.

Apart from using drawings and stories, team members should be encouraged to be inquisitive and develop the habit of using questions to clarify information and stimulate team thinking and discussion. In this study, team members often relied on questions to understand each other and clarify both problems and solutions. Participants from the academic and professional development programs often asked each other questions about their programs to confirm which instructor competencies were relevant to the course, and about their experience teaching at the Institute to develop the course content. Because many useful questions may be asked during a project, it may be helpful to orient the team towards first identifying broader categories from which to extract more specific questions. Categories can focus on the people involved, the project context, the nature of the problem or changes to introduce. As shown in Figure 9, the purpose of this exercise is more helping team members better understand their information needs than addressing specific problems. Once identified, categories can be used to tease out more specific questions for more detailed discussion, such as

- Who are the learners and key stakeholders?
- What are their expectations: what matters most to them? How do respective expectations contrast and compare?

- What is currently going on in the organization that could/should impact their design?
- What organizational norms or values must be considered to design something acceptable?
- What conditions exist that may be 'show-stoppers' (what may prevent completing the project)? How can they be managed?
- How are things now versus what should be? What should change after the training?

Figure 9: An Example of Question Categories



In this study, for example, core team members were often challenged to explain their rationale for designing a course specifically to meet the needs of instructors at the Institute and could not rely on assumptions to defend their position. Their own questions about instructor competencies, about instructing at the Institute or about what they should

learn through the course helped them address these objections from the extended team instead.

Stories, drawings and questions are all important ways for the team to learn more about a project and the problem to solve, and to improve participation and collaboration. Participatory design is a social process that can be improved by using tools like stories and drawings that are also more social in nature. Questions can be used to inform stories or drawings, or else gather more detailed information. Team members should therefore come to feel that contributing stories, drawings or questions is a normal part of the participatory design process.

Design

This activity is directly concerned with co-designing relevant learning activities. During design, team members work closely together to determine the course objectives, content, instructional methods and media to use, exercises, how to measure learning outcomes and how else to build a course that meets their needs.

Although traditional models of instructional design suggest completing specific steps or activities, they assume that the instructional designer makes these choices on his or her own. In contrast, participatory design proposes that team members decide together what must be done and how best to do it. It accepts that design is a flexible process that should be adapted to particular situations, circumstances, mandates or people without changing the need to follow key principles. In this study, for example, the team decided to use a DACUM to better understand instructor roles and responsibilities, and related competencies.

As discussed above, questions can help team members decide how to approach design and what to include in the course. Because they are also the learners who will take the course, participants should be encouraged to ask questions that matter to them. These questions, for example, reflect those the core team asked:

- What are the key differences between how I perform my job now and how I should perform it after training? What new competencies must I acquire and what does this mean in terms of learning new things?
- What learning objectives can be derived from the above?
- What characteristics do I share with others who will take the course that should be considered during design?
- What type of learning activities would best meet my learning needs while still taking into account existing conditions and constraints?
- What new content must I learn during each learning activity?
- What practical exercises would help me apply what I've learned?
- What tasks would fairly and accurately confirm what I have learned and how ready I am to competently perform my job responsibilities?
- What administrative requirements must be met to support the learning?
- How must the course be documented and what tools or templates should I use?

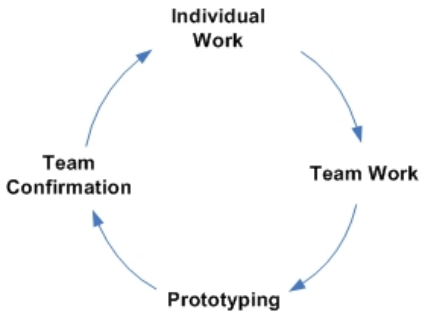
Experienced instructional designers will likely play an important role during design, as experts that can guide and help other team members. As discussed above, because participants likely won't be experienced instructional designers, each team should include at least one experienced instructional designer to help others work through

design problems. Experienced instructional designers must remember, however, that their role is not to decide for the team but to work with the team and guide it as needed.

Different tools and techniques can be used for this activity. This model proposes using two techniques in particular that were used in my study and that helped the team make better design decisions: designing iteratively and using prototyping.

Designing iteratively involves repeating a cycle of steps or activities until a desired result is achieved. The iterative cycle proposed here and illustrated in Figure 6, however, emphasizes more the cycle of interaction between individual and team work in a participatory design project – as observed in this study – instead of cycling through the steps of the design process as suggested in other ISD models. Figure 10 also proposes using prototyping more regularly than more traditional ISD models to confirm team decisions as they are made.

Figure 10: Design Cycle With Prototyping



Creating a course structure means determining how the pieces will generally fit together without addressing all relevant detail. This information can be documented in a course plan sufficiently detailed to demonstrate where the course starts and ends, what it

will include and how it will progress, but without addressing the details of course content or learning activities. That was the case in this project: based on initial team discussions, Peter created a document in the CMS outlining the course that became the course plan. That plan was refined during the project and then detailed into more specific lessons as work progressed. It provided the team with a type of blueprint to make more specific decisions as the project progressed.

Prototyping, and rapid prototyping in particular, is then used to test and confirm design decisions emerging from team discussions. Prototypes are typical examples of something (from physical products to conceptual drawings) used to try or test that something before releasing it for use. Prototyping is considered a key tool to get better feedback on the work done, identify important lessons and apply them back into improving both the design process and what is designed (Roytek, 2010; Jones and Richey,2000).

Rapid prototyping for instructional design is defined as "the development of a working model of an instructional product that is used early in a project to assist in the analysis, design, development and evaluation of an instructional innovation" (Jones and Richey, 2000). What makes prototyping rapid is not only doing things faster but more importantly doing only what is needed for informed decision making. Detail and functionality matter less than developing a working understanding of what does and does not work in reality. Using rapid prototyping during participatory design allows team members to experience the consequences of their design decisions as they progress, and then continually improve them (Carr-Chellman, 2006; Roytek, 2010; Holtzblatt *et al*, 2005).

As noted in the case, individual and team work can be combined during this activity to better complete each cycle. The team in this study used individual work regularly to complement team efforts. They researched the course content, identified or reviewed instructor competencies and completed other tasks in preparation for team meetings. Using participatory design therefore does not eliminate the need for individual work, but emphasizes instead the need to judiciously balance individual and team work to progress more efficiently. It also gives each team member the opportunity to contribute something more personal and meaningful.

Prototyping can be used to test and confirm many different types of learning materials and activities, and does not always mean trying something out physically (like leading a session). As seen in this case, for example, draft session plans can help test ideas about specific lessons or activities and how best to support learning. Prototyping can also be used to try learning materials, student manuals or instructional aids.

Prototyping, however, is not always effective or useful, especially when situations or circumstances suggest only one option. In some cases, prototyping may not be needed at all while in other cases it may only be used occasionally. In this study, the core team agreed to use a cycle that nearly invariably started with individual work followed with team discussion leading to design decisions. Course documents created in the CMS during the design process were used to prototype sessions, confirm they were acceptable and that the design process generally remained on track. The team did not create actual prototypical sessions to try and test, but used session plans or other documents instead to test ideas.

Some of the key characteristics of this design cycle are therefore,

- Recognizing the importance of balancing individual and teamwork to be more effective and efficient.
- Integrating prototyping as a regular activity to support team discussions and decision making.
- Providing recurring decision points to test design decisions 'on-the-go' rather than only at the end (during pilot testing for example).
- Making it easier to adapt to project changes by incorporating them into the course design as they occur.

Phase 4: Trialing

Trialing corresponds to the project management phase of Monitoring and Controlling. It includes tracking and reviewing the project and the team's work to identify any changes that may be needed to achieve the project plan. In this model of participatory design for workplace learning, it also includes pilot testing the course before releasing it for general use. Trialing therefore allows validating the course design by trying it under similar conditions that should exist when it is offered generally.

The responsibilities of the participatory design team during this stage will likely vary from project to project. Ideally, team members will attend and actively participate in the pilot, but this may not always be possible, as was the case in my study. Team members may therefore assume different roles and responsibilities as needed: they may be students, observers or co-instructors, as was also the case in my study. If the course must be taught by someone outside the design team, that person should meet with the

team and review the course with team members before teaching the pilot course. The following discussion explores the specific activities in trialing.

Preparing for Trialing

Trialing should include testing administrative procedures, like those to register students and handle logistics, as needed. This may be especially important when implementing new administrative processes or procedures, but should not be done at the expense of testing the course design. What matters most during trialing is collecting useful information for the design team to review and improve its work.

To properly test the course design, the pilot course must be offered to students from the target population to confirm it meets their needs and not those of another population (George and Cowan, 2004). Their role and that of the instructor(s) during the pilot should be clarified and discussed as needed. Participants must understand the purpose of the pilot course and the type of feedback needed to improve it. In cases when the course leads to a professional certification that may affect employability, it is important to clarify with students what may happen if the course does not meet its objectives and prepare them well for certification. The trialing process must therefore be transparent and acceptable to all involved: the design team, the pilot course students and course sponsors or stakeholders. Finally, tools must be prepared to collect comments and other feedback about the course, and to analyze feedback quickly and easily.

Leading the Pilot Course

The pilot course should start by reviewing what will take place during the course and setting ground rules about participation and feedback. In this study, for example, ground rules and expectations had to be reviewed and clarified again on the second day of the course, even though the instructor had clearly explained what would happen during the first session.

Whenever possible, the project sponsor should attend the first session to confirm management support for the course and hear student questions or comments directly from them. Attending this session and discussing the course with participants provides tangible evidence of management's support for the course and interest in the participants' experience of it. Because Larry did not attend the first course session, he could not discuss the course directly with participants and address their questions about the rationale for designing a new course on instructional techniques.

The course should then proceed as planned with as few changes as possible along the way. Any essential change should be discussed with the instructor and the design team to confirm how it may affect the course design and how best to proceed. These discussions can lead to a form of double-loop learning: learning first occurs by identifying and resolving specific problems within the course (single-loop learning) followed by learning about making better use of instructional design techniques to create better courses generally (double-loop learning). (Argyris and Schön, 1996).

Students should complete evaluation forms and be interviewed to more directly express opinions, comments and concerns, and discuss improvements. It should be clear to all students that the purpose of these interviews is to improve the course and not

discuss their performance. Class discussions, or group interviews, should also be used to complement individual interviews. Group discussions may allow identifying common themes that may not be apparent during individual interviews.

All relevant information must be carefully collected and collated for future analysis. Capturing all relevant information is not only important to analyze course results but also to prepare a report on the pilot course and the project. Relevant information may include instructor notes, evaluation forms, interview results, student performance evaluations, observer notes or any other relevant information.

Reporting

Reporting involves analyzing the information gathered during the pilot course and summarizing results in a formal report for project sponsors and stakeholders. Although it may be more efficient for one team member to write the report, the entire team should review and discuss the course results and decide what to report. The report should describe what took place during the design process, how well participatory design worked and how to better use this methodology in future projects. The final report should be clear and concise and discussed directly with the course sponsor(s) and stakeholders whenever possible.

When reviewing the course, the team should consider (Theofanos and Quesenbery, 2005; Dick, Carey and Carey, 2005),

- What happened during the course and why it happened (people, context, situations, and circumstances).

- What differences were noted between what was designed and what was taught, and how to explain them.
- What to recommend to stakeholders and to the course sponsor about the course.
- What happened during participatory design and how effective it was to design this course.
- Ways to improve the participatory design process.
- Ways to improve participation and optimize collaboration and team work.
- Problems encountered during the project and how they could be resolved in future projects.
- Opportunities to use participatory design in future projects for workplace learning.

Reporting should also address problems with getting stakeholders involved and actively contributing to the participatory design process. The purpose of reporting on problems of participation is to improve the participatory design process by feeding back into the planning process important information about what worked and what could be improved. It is therefore about applying a typical feedback look to capture lessons learned and use them to improve next projects. This is particularly important when there is an interest in using participatory design regularly for workplace learning. It may help identify and address problems in the organization that prevent or hinder effective collaboration generally or in other projects. By identifying and tackling problems that prevent effective collaboration, organizations may be able to improve the organizational context and make working together more effective.

Closing

This last phase of this proposed model of participatory design for workplace learning focuses on capturing lessons learned and dissolving the team. It provides the participatory design team with a final opportunity to discuss their experience together and learn from it.

Closing the project involves a formal meeting of the design team. The meeting signals the end of the project and therefore releasing team members from it. It is also the point where the completed course is handed over to the unit or individuals who will offer it in the future. Closing is therefore about ending the project in an orderly fashion, sharing personal perspectives about the design experience and how to make it better.

Although closing should occur in all projects, it is often forgotten or omitted because there is no time, because team members have already been reassigned, or for other reasons as happened in this case.

The literature on project management, however, strongly recommends a formal closing to a project (Project Management Institute (2012); Haugan, 2011). That's because closing

- Improves the quality of design by reviewing lessons learned.
- Improves team work and project participation by reviewing achievements and finding ways to improve team work.
- Increases individual and organizational satisfaction with the project and the work accomplished.
- Raises the comfort level with participatory design and increases support for using it in other instructional design projects.

Part of this phase also includes an additional meeting with project sponsors and stakeholders to informally review project results and using participatory design. These conversational interviews offer an opportunity to capture more personal reactions to the participatory design process and better appreciate how the process impacted sponsors and stakeholders. These informal meetings complement the more formal closing meeting to review the project report; the informal meeting should not replace the formal one.

Closing is also an opportunity to celebrate achievements and recognize team efforts. It is an opportunity to leave team members feeling positive about their experience and encourage participation in other projects. Because important problems will likely already have been identified in the project report, this meeting becomes an opportunity to recognize the contribution of team members and acknowledge their efforts. Finally, the closing meeting is an opportunity to explore personal feelings and opinions about participatory design, using questions like these:

- How was the participatory design experience from professional and personal points of view? Would team members do it again? Would they encourage colleagues to participate in other similar projects? Why, or why not?
- How was teamwork in this participatory design project? Were the right team members recruited? Were they given enough information, and/or tools? Were they given enough opportunity to learn to work well together before getting into more demanding tasks?
- How easy or difficult was it to design a course together? What challenges did team members encounter with participatory design and how were they overcome? What was easiest or most difficult to understand or do?

- What would each member do differently personally if asked to participate in another participatory design project?
- How was the project managed and carried out? How could that be improved? Did the project structure and management support participatory design well?
- What risks did they see in using participatory design for workplace learning? How can they be mitigated?

Participatory Design for Workplace Learning

Earlier in this chapter, I answered the research question that guided my study before proposing a model to apply key principles of participatory design for workplace learning.

In answer to the main question, participatory design can be an effective alternative to more traditional models of instructional design for workplace learning. It offers the advantage of allowing those directly concerned with learning something for better job performance to co-create the learning activities most useful to them. At the same time, participatory design can be demanding in terms of time and the need to involve more participants from different parts of the organization. Some experienced instructional designers will likely naturally feel comfortable with using participatory design while others may find this methodology demanding and difficult. In any case, instructional designers must expect that their role and responsibilities will change when using participatory design compared to when using more traditional models of instructional design.

Project management is an essential part of participatory design to structure activities, work with project sponsors and stakeholders, address problems and organize team work. Well structured projects are more likely to gain sponsor and stakeholder approval and support over time, and good project management can be expected to improve what will be achieved using participatory design for workplace learning. As noted earlier in the last section of the chapter, project management parallels participatory design in many ways.

Finally, because participatory design more directly involves participants that may come from different parts of an organization and that may have different interests or concerns, understanding context and taking contextual elements into account during participatory design is an essential condition for success. Ignoring context may be equivalent to ‘designing in a vacuum’, which contradicts the fundamental principle of participatory design to involve all those concerned in the design process. Applying the principles of participation and collaboration, using good project management practices and fully taking context into account therefore remain key principles of participatory design and the cornerstones for using the model proposed in this chapter.

CHAPTER 6: CONCLUSIONS

This chapter briefly reviews this study on using participatory design as an alternative to more traditional instructional design models for workplace learning and offers some conclusions. After offering some personal comments about conducting this study, I discuss the implications of using participatory design for workplace learning, review its limitations and propose avenues for further research.

SOME PERSONAL OBSERVATIONS ABOUT CONDUCTING A STUDY ON PARTICIPATORY DESIGN

I started this study on using participatory design for workplace learning with some trepidation and concern about what might happen during the study. Because I had not personally led a project that used participatory design before, I could not easily anticipate what could happen that might either interfere with or cancel the study. I was keenly aware of the various problems that often affect projects and how some of them might be amplified by increasing participation in the design process. Although willing to participate in the study, the Institute and its instructors might simply not be able to live up to its demands. If this happened,

I determined to identify contributing factors as best as possible and how they affected this attempt to use participatory design for workplace learning. In the end, the project was completed as expected and I was able to gather relevant data.

Some challenges did come up during the project that could have impacted the study directly. For example, I wondered how team members would react to the pressure they faced from the extended team to do things otherwise, especially when it became clear that core team members were becoming increasingly uncomfortable or frustrated with these difficulties. When Peter became ill and had to go on leave, I was concerned that the project would slow down, stop or otherwise lose its momentum thus negatively affecting members of the core team. In the end, however, core team members worked through these challenges and found ways to keep progressing without my help or intervention.

This experience of doing a study on participatory design highlighted the importance of building good teams and encouraging good team work. Based on this study, it appears that team members overcame the challenges they faced more because of their commitment to designing a course they wanted than because of other factors like organizational support. Good team work may therefore be even more central to effective participatory design than what is generally reported in the literature. Good team work based on individual commitment to participate and contribute may therefore be one of the most important factors for using participatory design effectively in the workplace.

It is difficult to determine how much of the team's commitment to the participatory design process in this study reflects their own interest and motivation and how much reflects participating in a study. It is possible that because they were observed, team members wanted to do well and would have done their best regardless of the nature of the project undertaken. But I don't believe that was the case: nothing in the data gathered for this study suggests that team members were primarily motivated by participating in a study, whatever that may be. Instead, team members reported having volunteered for the project and continued to participate and defend their work even after facing strong pressure to do otherwise. Personal motivation to be involved in designing the course seems to have been a greater factor in the team's behavior than participating in a study.

IMPLICATIONS OF USING PARTICIPATORY DESIGN FOR WORKPLACE LEARNING

This section discusses the implications of using participatory design for workplace learning. It considers how using participatory design for workplace learning may become even more popular or important as social processes become better established in organizations. It then considers some of the demands that using participatory design may place on organizations and their potential effects.

Social Processes At Work

Participatory design was first introduced to address problems in the workplace nearly four decades ago but has since remained relatively unused in instructional design for workplace learning. Perhaps this is because participatory design is fundamentally a social process and that using social processes at work to improve individual and organizational performance remains a recent phenomenon. When participatory design was first introduced in Scandinavia in the 1970's, models of instructional design had already existed for some years that reflected an engineering approach to problem solving more than a social one. In some ways, participatory design may then have been ahead of its time and may have had to wait for the workplace to become more open to using social processes before being recognized and accepted as a method to design workplace learning.

Organizations now increasingly recognize the importance of social processes and collaboration to achieve their objectives, partly because their employees are already committed to using social media themselves. "As the communications landscape gets denser, more complex, and more participatory, the networked population is gaining greater access to information, more opportunities to engage in public speech, and an enhanced ability to undertake collective action." (Shirky, 2011).

Although evidence-informed research on the use and value of social networking and other social processes in organizations remains limited, a growing

pool of research and trade industry communications suggest that social interaction in the workplace is a growing and important trend increasingly recognized as fundamental to both organizational success and employee satisfaction. There is reason to believe that social interaction will continue to grow and spread throughout organizations, that it will become an accepted way of doing work and that it is becoming a preferred way for peers and colleagues to communicate (or at least for the younger generations) (Hart, 2010). As a social process that builds squarely on principles recognizing the value and importance of employee participation, participatory design fits well in this trend towards social interaction and directly contributes to achieving the advantages of cooperative work.

The Demands of Using Participatory Design

The results of this study suggest that participatory design can be used effectively to design instruction for workplace learning. At the same time, the study recognizes that using participatory design may be more demanding than using other models of instructional design. Participatory design may be more demanding because it involves more participants, because participants have other responsibilities, because instructional designers need to learn new skills, because the design process is more flexible or because organizations don't truly support participation and collaboration. But it also has benefits: in this study, core team members were highly motivated to participate and overcame many obstacles, co-

designed a learning solution that mattered to them, helped each other learn about instructor competencies and their application at the Institute and gained a strong appreciation for the value of working together to solve problems.

User Participation

The review of the literature on User-Centered Design identified four problem areas to consider when using UCD: user participation, project management and work, organization and communication. The results of this study suggest that these problem areas may also apply to participatory design. This study, for example, was characterized by different levels of participation that were not equally effective: core team members participated regularly and well whereas members of the extended team did not participate as well and could not be depended on to complete the project. As discussed above, there is reason to believe that successfully completing the project depended as much if not more on the personal motivation and commitment of core team members than on other factors.

As observed in the low and resistant participation of the extended team members in this case, employees may also be reluctant to participate in participatory design projects: for lack of interest, for misunderstanding the potential benefits of doing so, because of perceived conflicts between using participatory design and the underlying values of the organizational culture, for

being uncomfortable with the task ahead, because existing conditions do not support open collaboration, or for other reasons. Participatory design represents a new way of doing things that must be introduced gradually through discussion and smaller projects, to gain experience and support in the organization.

Finally, some problems may surface because of growing tensions between participants and non-participants in the participatory design process. In this study, there was noticeable tension at times between members of the core and extended teams because of disagreements about how best to meet the needs of instructors at the Institute. Although members of the core team all regretted the lack of participation from extended team members, they eventually accepted not being able to overcome their objections and having to continue without their help. In some ways, this may have helped create a type of "us and them" attitude that may have either inadvertently amplified the problems between them or else caused respective positions to harden.

While the participants in this study were able work through these problems and complete the project as expected, this may not always be the case when tensions between participants and non-participants become so strong they can't be overcome. Tensions that crystallize into resistant behavior may prevent forming good teams or else keeping a design team productively engaged in the design process. In the most difficult cases, the tensions that develop during a participatory design project may continue to affect the work of those involved

after the project. Although the results of this study do not justify identifying tensions between participants as a major problem likely to affect all participatory design projects, they emphasize the need to study well the context in which participatory design will take place and to identify and address early on issues that may cause tension between participants. Management as a project stakeholder and the project manager should work together to identify and address these problems.

Project Management

Managing the project and the work underway was also important to successfully designing the course. The participants in this project made it clear that Peter played an important role as project manager and leader and that they appreciated his work. There is reason to believe that without someone to act as a catalyst, facilitator or organizer, this project may not have achieved its desired outcomes or perhaps not as well.

The study also highlighted the importance of the organizational context and ensuring organizational support. Even though the participants in this study received good support from management, the context that existed at the Institute in terms of the organizational culture, the work habits in place and how they developed, the history of management and leadership there and different points of view about the relative importance of career progression were all factors that affected the project in one way or another. Finally, the study highlighted the need

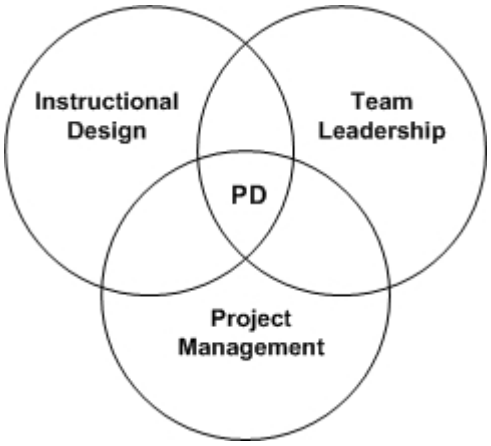
to communicate regularly and extensively with all stakeholders to inform them of the project, keep them involved and correct misunderstandings that may occur.

The data from this study suggests that the project may have been easier, completed more quickly or perhaps more successfully if these problems had been fully addressed. At the same time, however, the nature of work and of the workplace may simply not allow anticipating and addressing potential problems ahead of time or when they occur. It would be unreasonable to expect that participatory design will only occur under desirable conditions and users should expect that availability, commitment, project management and leadership, the organizational context and the ability to communicate effectively will continue to impact their projects.

Instructional designers wishing to use participatory design must accept the need to not only contribute their design expertise but also manage projects and lead teams. The results of this study suggest that successfully using participatory design for workplace learning requires integrating the three skill sets illustrated in Figure 11 for instructional design, project management and team leadership. Existing models of instructional design tend to assume that instructional designers will manage their design projects and lead their teams but these skills are not emphasized when formally learning about instructional design and must often be developed separately. The results of this study suggest instead that instructional

designers should prepare more formally to manage projects and lead teams in the workplace.

Figure 11: Skill Integration for Participatory Design



It should also not be assumed that organizations will recognize the potential value of participatory design and encourage its use, even if they generally support using social processes at work. Many organizations are still transitioning to using social processes and may not be ready for participatory design: they may not yet wish to include employees in decision making, may be committed to using other models of instructional design, may not be able to allocate the time needed to collaboratively design instruction or may simply not see the value of collaborative work. Successfully using participatory design for workplace learning is therefore not only about understanding that method well

and developing the skills to apply it, but also about ensuring the organizational context support participation and collaboration. Because this model of participatory design integrates well established project management principles and practices, because it relies on the structure of a project to carry out participatory design and because most organizations already use projects and project management regularly to achieve their objectives, it might transfer well to other organizations involved in workplace learning.

At the same time, the part of this model that focuses specifically on using participatory design requires that managers think differently about who should participate in a project and how participation should occur. Because of this, it cannot be assumed that knowing about projects or project management is enough to successfully use participatory design for workplace learning. In other words, having good project management skills alone does not guarantee using this model effectively. That requires instead becoming familiar with participatory design and accepting that project management and the project structure are important frameworks, but that using participatory design requires also following other key principles and practices.

Using Participatory Design

The model of participatory design for workplace learning proposed here is not an all-or-nothing proposition: instructional design projects do not always

require a team effort or following the five stages of this model. In some cases, like when revising existing courses or designing training for well defined knowledge and skills, or when time is short or participants not available, the instructional design process may be more efficient and effective if it follows another model of instructional design or if the project is given to an instructional designer. This is an important reason why this model of participatory design emphasizes starting a project by deciding how to approach design and which model to use.

No specific list of criteria currently exists to decide if or when to use participatory design for workplace learning. However, given the context of the workplace, the decision to use participatory design or not should at least consider the following:

- Organizations wishing to use participatory design should appreciate the value of employee collaboration and participation, and actively support it.
- The problem to address involves a performance gap that justifies team discussion and interaction. Participatory design is not appropriate to address clearly defined performance problems for which obvious solutions exist, that can be addressed directly by an instructional designer or that involve learning simple and repetitive tasks.
- There is a real work problem to address that concerns a group of employees enough to want to resolve it.

- Time, availability and other constraints are not so important that they will likely prevent using participatory design as intended.

Finally, participatory design is first and foremost a framework of guiding principles that can be applied in different ways, and therefore not only through a formal model. Instructional designers that promote participation and collaboration and involve learners in the design process, who carefully manage their design projects and also carefully consider contextual elements when making design decisions will do more to use participatory design than by only following the steps of a process.

In some ways, it might be more useful to define the requirements of participatory design in terms of competencies than in terms of a model with phases and activities. For example, it may be possible to modify the instructional design competencies developed by ibstpi (or by other professional associations) to more fully emphasize the importance of following key principles and of managing projects well. Working with competencies might also better reflect how participatory design is a flexible and adaptable process from which good design emerges instead of resulting from doing specific activities. It should not be assumed that existing competency models already cover those competencies well enough; models should instead be reviewed and competencies reworded as needed to emphasize the knowledge and skills of good team work, facilitation and project management.

LIMITATIONS OF THE RESEARCH AND POTENTIAL CONTRIBUTION

This research has a number of limitations to consider. In particular, it is based on a single case study at a single location, the design process did not include all possible stakeholders, and not all steps of the proposed model for participatory design for workplace learning were applied as proposed.

This qualitative case study investigating the use of participatory design as an alternative to more conventional models of instructional design for workplace learning was carried out in a single Canadian government institution employing French and English speaking North Americans. The results of this study therefore cannot be generalized to other environments. In particular, because this study focused on using participatory design for workplace learning and because study participants were working adults, it cannot be generalized to school settings.

Because this study was carried out in a single location, research carried out in different locations may yield different results. This model of participatory design for workplace learning identifies in particular the importance of the context when using participatory design. If this study, for example, had been done in another organization with another context, it might have been easier to resolve the problems that occurred between the core and extended teams, or perhaps to only have one team. Because different organizations have different contexts,

change management issues and views about using social processes, it may be necessary to replicate this study a few times in different organizations before reaching conclusions that can be generalized.

This study also did not equally include all project stakeholders. For example, there was no opportunity to bring all stakeholders together to meet and discuss the project. Future research on participatory design for workplace learning may therefore need to more closely examine the role of stakeholders in a participatory design project.

Because this study was a real-world case carried out in the workplace and because participants decided together how to design the course, it did not follow all of the steps proposed in this model of participatory design. Additional research is therefore needed to confirm how well the model can be applied as proposed in different cases.

Despite these limitations, the results of this study may be transferable to other organizations. For example, the results might be transferable to similar organizations within the Canadian government or to private sector enterprises with similar characteristics as those of my research site. Lincoln and Guba (1985) define transferability as the degree to which qualitative research findings can be applied to other contexts and suggest that rather than indicating a range of situations to which the results of a qualitative research can be transferred, readers should use the thick descriptions that are typical of good qualitative research to

decide themselves which study findings may apply to their context and how well they apply. Readers actively involved in workplace learning in organizations may therefore find some guidance in this study to further explore how to use participatory design in their own organizations.

The originality of this study lies in its focus on using participatory design for workplace learning, more specifically in the Canadian Civil Service . Participatory design is not yet well known as an alternative to more common models of instructional design for workplace learning and there is little research available that considers specifically how to use it to meet learning needs in a specific workplace. This study also provides an opportunity to explore the practical aspects of using participatory design for workplace learning. Because the case studied involved creating a course that was used for workplace learning, it allowed exploring what may actually take place during these projects, how to structure and manage this type of work, and how to deal with different conditions or constraints. It may therefore provide a starting point for others to investigate using participatory design in their organization and make it a useful alternative to more traditional approaches to design workplace learning.

Another limitation is that the project did not get the full participation of all key stakeholders. For example, although members of the core team did consider the needs of regional instructors when designing the course, these instructors were not represented on the core team and therefore could not contribute directly to the

course design. Participatory design should seek instead to include representatives from all stakeholder groups to consider their needs and input, to clearly communicate the project's purpose and expected outcomes to all concerned and to better understand and address the issues each target population may face.

SUGGESTIONS FOR FURTHER RESEARCH

Many other studies would be useful to complement and further inform this one. For example, this study could be replicated in different types of organizations to investigate how differences between organizations may influence the participatory design process, the model describing it and expected outcomes. Studies could also investigate the conditions under which participatory design is used and how they impact that process. They could, for example, investigate the influence of project complexity on the use of participatory design, or in other words the extent to which the inherent complexity of a project may limit what can be achieved with participatory design.

Another important area for further research is on teamwork for participatory design, investigating for example the factors that influence teamwork and how best to manage them to improve participatory design. While Tuckman's (1965) model of group development remains widely quoted to explain teamwork, nothing in this study suggests this team behaved like those in

Tuckman's model or that it would have under different conditions. Future research could therefore reconsider the use of participatory design for workplace learning from the perspective of the teamwork involved and the factors that determine a team's effectiveness in modern organizations.

Further research may also reconsider what constitutes participatory design. Pilemalm and Timpka, for example, proposed using an approach reflecting what they call a third generation of participatory design to meet the needs of large projects in which participants are a more heterogeneous than homogeneous population with different needs and interests. Would changing the basic definition of what is participatory design change how or how well it can be used for workplace learning?

Additional research on the use of social processes in organization would also be helpful. As organizations learn to integrate and better use social processes at work, will participatory design become an accepted way of doing things that no longer needs to be carried out as specific projects? Research could also investigate the influence of culture on social processes. For example, studies could explore the influence of the organizational culture on building social processes that support participatory design, or else explore the influence of personal culture on team work during participatory design. There are also likely many other potential studies to explore the human factors involved in building effective participation and collaboration when using participatory design.

Future research could also investigate informal learning during participatory design and its potential role improving the participatory design process. For example, does informal learning help improve the quality of design decisions as team members learn from each and from the design task? Research could also compare what team members learn informally while designing a course against what others will learn more formally from taking the course.

Finally, while this study focused on a team of experts that were co-located and because more and more work is done at a distance, it would be useful to study how participatory design may be used by teams whose members are at different locations and that must use social media or other types of computer-mediated communication to participate in the design process.

APPENDIX A: CALL FOR PARTICIPATION IN A UNIVERSITY RESEARCH PROJECT ON PARTICIPATORY DESIGN FOR WORKPLACE LEARNING

This document outlines the purpose and proposed process to complete an exploratory study on the use of participatory design as an alternative to more traditional Instructional Systems Design (ISD) for workplace learning. It is intended for companies, organizations and individuals who may wish to participate in this study.

This study will be carried out in partial fulfillment of the requirements for a Ph.D. in Educational Technology at Concordia University, in Montreal, Quebec. It is carried out under the supervision of Dr. Saul Carliner, Associate Professor, Faculty of Education, Concordia University.

This document is generally structured as a Frequently Asked Questions file to more quickly and easily access relevant information. Feel free to browse through the document or follow these links as preferred.

Thank you for considering participating in this study!

Jean-Marc Guillemette

Principal Researcher

2904 Fairlea Cr., Ottawa, Ontario K1V 8T7

Tel: 613-304-5769

Jean-Marc.Guillemette@cma.ca

jmguil@rogers.com

What is the purpose of this study?

The purpose of this study is to explore how participatory design can be used as an alternative to Instructional Systems Design for workplace learning. It requires completing a project in which participatory design will be used to create a learning solution in response to a clearly defined workplace learning problem. It will help better understand potential differences between participatory design and other more traditional instructional design methods, explore the use of participatory design for workplace learning, investigate potential benefits and pitfalls, study relevant group dynamics and evaluate results.

The study therefore includes theoretical and practical aspects. From a theoretical perspective, the study will inform our understanding of how participatory design can be used for workplace learning, while from a practical perspective it will allow addressing real workplace learning needs.

Top

What is Participatory Design?

Participatory design is an approach that recognizes the importance of fully involving users and other stakeholders in a design process. Developed originally

out of efforts to improve the design of software and computer systems, it has since been applied in various fields including education.

The cornerstone of participatory design is participation - a process in which two or more parties influence each other. In the case of projects to design computer systems, participatory design often includes trade unions, management representatives, IT specialists and system users as equal partners in decision making and solution building. In workplace learning, participatory design should at least involve employees from the target population working with an instructional design specialist. It may also include subject matter experts, managers or even clients working together to co-design relevant learning materials and activities.

Participation and team work are key elements in participatory design. Each participant can directly influence the decision making process and team members work together to identify and resolve design problems. What is designed should therefore reflect less the ideas and opinions of a single designer and more those of the eventual learners.

Top

What type of project could be used?

There are two fundamental criteria to identify potential projects for this study. First, the project must seek to address a real problem involving workplace learning. Your organization (and those involved in the project) must benefit from the project outcomes in the form of a solution leading to improved job performance through learning.

Second, the project must be sufficiently important to motivate and sustain participation. Those involved in the project must consider it worthwhile (regardless of what it means to the study) and be interested in actively participating in designing a solution.

Examples:

(a) Your sales team must learn to use new tools to manage customer relationships. Sales persons, the sales manager and customer service representatives all have a stake in improving job performance through these tools. They are willing to work with one of your instructional designers to design relevant learning materials and activities.

(b) Your company has decided to change its strategic planning process. Company managers must not only become familiar with the new process but must also 'buy-in' to the changes involved. A representative group of managers, a few members of the senior management team and a member of the human resource group specialized in change management are willing to work with one of your instructional designers to design relevant learning materials and activities.

Top

Who should participate as a member of the project team?

The team should first and foremost include employees representing the target population that should benefit from what is designed. The team could also include one or more stakeholder with a true interest in the design process and its outcome (such as a manager overseeing the work of employees to trained). Team members must be able to participate in all activities and contribute worthwhile experience and expertise.

The team should also include an instructional designer from your company who will act as project manager and instructional expert. Finally, one or a few subject matter experts may be needed depending on the type of content covered.

Top

Can this be a virtual team?

Yes! Team members can be either co-located or geographically dispersed. Meetings and other work can be done online, using company-owned or internet based collaborative tools, or even via simple email.

Top

How would participants be recruited?

As much as possible, team members would be volunteers interested in the project and able to contribute. If there are not enough volunteers, some participants recommended by their manager or colleagues may be individually approached and invited to participate. All individuals, however, will have the opportunity to independently decide if they wish to participate.

Top

Will individual participation be evaluated?

No, participation is not evaluated. Individual participation will not be formally evaluated and reported to management. The researcher will, however, use different means to record what happens during the design process. Since this study uses a qualitative approach to investigate participatory design in the workplace and since qualitative research requires developing a detailed understanding of situations and events, the researcher may record meetings on an audio tape to complement his notes. Recordings and notes are essential to review conversations and descriptions of events later and develop a better understanding of what took place. This information, however, is considered strictly confidential and ***will not be shared with anyone (no exceptions!)*** outside the study. Each participant will be asked to confirm they agree with audio recordings and note taking before the study begins. Those who are not comfortable with this procedure may withdraw from the study.

Top

What would be the role of the instructional designer?

The role of the instructional designer is two-fold: first to act as the project manager and second to act as a learning expert.

As project manager, the instructional designer would guide the design process, arrange meetings, ensure participation, keep the team focused and productive, help resolve problems and guide the project to its conclusion.

As a learning expert, s/he would help other team members understand what learning principles may be involved and how they work, suggest specific ways to improve the learning experience, gather and integrate input into learning materials and otherwise help the team make the best decisions about the quality of the learning experience.

Top

What should be the qualifications of the instructional designer?

The instructional designer should not be a novice but does not require extensive experience either. Ideally, s/he would have a solid understanding of established instructional design principles and techniques, have some experience managing instructional design projects, understand organizational goals and values and be comfortable facilitating team work.

Top

Who is the principal researcher?

The principal researcher is Mr. Jean-Marc Guillemette.

During his career of over 35 years in education and workplace, Mr. Guillemette has held positions and completed numerous projects involving the design, development, delivery and management of learning materials and activities. His experience includes managing operations, staff and finances, as well as projects for internal and external clients, locally, nationally and internationally.

As an educator, Mr. Guillemette has developed and delivered hundreds of courses on a wide range of subjects, including the management of training, instructional techniques, instructional design, coaching and developing e-learning. He has created e-learning and other self-instructional materials and has earned a solid reputation for creating learning experiences resulting in practical and lasting knowledge and skills improvement.

Mr. Guillemette is fluently bilingual (French and English) and is comfortable working in both languages. He possesses a Bachelors Degree in Visual Arts as well as a Masters Degree in Educational Psychology, both obtained from the University of Ottawa.

Top

What would be the role of the researcher?

The researcher will accompany the team, observe what takes place, offer guidance about using participatory design when needed and gather all necessary information to document and understand what takes place. The researcher will not direct the team or the design process. The team itself will work together through the design process, discussing issues, making decisions and resolving problems together.

Top

How much would this cost?

Some funding may be needed to complete the project, as for any other project. There is no additional funding needed for the study per se (to purchase equipment, pay honorariums, cover researcher expenses, etc.).

Top

How long would the study last?

Since the study is directly linked to a project, it would last only as long as needed to complete the project. Project timelines would depend on the objectives, conditions or constraints set by your organization. The project may therefore be completed within a few weeks or perhaps a few months. It is recommended, however, to select a project that can be completed in no more than three or four months to keep timelines manageable.

Top

What happens if something goes wrong?

The best way to address problems is to discuss them openly and honestly. Working closely with the team, I will lead discussions as needed to identify and resolve problems that could otherwise disrupt the project. Every effort will be made to ensure that project objectives are achieved, as a minimum.

Top

How will the study results be published? What about confidentiality?

Results will be published first in a dissertation that will be submitted as part of the requirements to complete a Ph.D. in Educational Psychology, at Concordia University in Montreal, Quebec. Results may also be published in academic journals or other similar publications.

To respect confidentiality, your organization's name and those of participants will not be used. Pseudonyms or other generic terms will be used instead (for example, identifying you as a Canadian high-tech company). Information received about your company and its activities received during the project will be kept confidential and returned before the end of the study. You will be allowed to check and confirm at any time that what is reported in the study does not violate your confidentiality.

Top

Please feel free to contact the researcher with any additional questions or to further discuss your participation.

APPENDIX B: OVERVIEW OF THE PROPOSED STUDY ON PARTICIPATORY DESIGN FOR WORKPLACE LEARNING

[Name]

[Canadian Government Training Institution)

March 27, 2009

Subject: Participatory Design Within the Small Vessel Command Course Project

Dear [Name],

As requested in your recent email, this letter outlines some of the typical steps involved in a participatory design project as well as the level of effort that may be expected from participants. It complements the information already provided in the document introducing my study and requesting your participation as a research site.

Project Phases

Participatory design is essentially a collaborative approach emphasizing the continuous involvement of users and stakeholders in a design process. A fundamental principle of participatory design is that design is more effective when users directly contribute to all parts of a design process. Design efforts also benefit from the synergy achieved through increased participation and collaboration.

While more traditional instructional design models, like ADDIE[1], require following a series of formally defined steps, participatory design is more flexible and adaptable to situations and circumstances. For example, one project used a series of courses to foster participation and collaboration while another used field work completed during normal work hours to involve staff in a design process.

For this project, I propose using the four phase participatory design process illustrated in Figure 1:

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[1] ADDIE is the acronym for the steps of a well established instructional design methodology: Analysis, Design, Development, Implementation and Evaluation.

Figure 1: Project Phases

Project Design Application Results

Phase 1: Project Framing[2]

- State problem
- Assemble team
- Define individual and group participation
- Define expected outcomes
- Identify key conditions / constraints

Expected outcome: consensus amongst team members and stakeholders on what to do, in how much time, to achieve what results, and how to deal with project conditions or constraints.

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[2] The list of items included in each phase is not exhaustive, but rather illustrative.

Phase 2: Design Sessions

- Vision statement of the desired learning intervention
- Strategic and critical problem analysis
- Select learning strategy
- Develop content
- Create learning activities and materials
- Prototyping
- Recursive review and improvement

Expected outcome: module / learning activity ready for pilot testing.

Phase 3: Application

- Testing the learning module / activity and materials with actual students, under real conditions.
- Expected outcome: comprehensive data on the pilot and on how well expected outcomes were achieved.

Phase 4: Results Analysis

- Detailed results analysis
- Reflection on project outcomes: how well they were achieved, strengths and weaknesses of what was designed, opportunities for improvement

- Recommend / make necessary changes
- Project review: what worked / didn't worked with participatory design
- Report to stakeholders
- Team dissolution

Expected outcomes: project report outlining the process, results achieved and recommendations for improvements.

In line with the principles of participatory design, it is recommended that final decisions about the steps or phases to be completed be made with stakeholders and other project participants. My role as principal researcher would be to guide and inform this discussion without imposing steps.

Staff Commitments

As indicated above, team members will be expected to actively contribute to all project phases, by attending meetings (actual or virtual), discussing issues, sharing information, assisting others, participating in decision making, or reviewing process or product. This general level of participation is represented by the outer ring in Figure 2 and should only require part-time participation.

Team members may also be given specific tasks, based on their experience, expertise or availability, that require more time to complete.

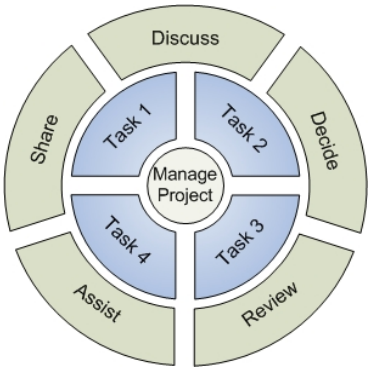


Figure 2: Levels of Engagement

Finally, the project manager will complete all regular project management tasks and is expected to spend more time on the project than other participants.

The specific amount of time required from each team member depends on project timeline and complexity. From a research perspective, it is not necessary for team members to participate full time. This study will also seek to answer questions about the level of time and effort needed to complete an instructional design project using participatory design and how feasible it would be to expect staff generally to undertake such projects.

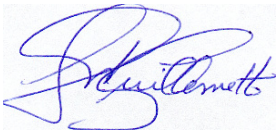
As a general rule of thumb, this project may require about 20% more time overall from each participant than typical instructional design projects (more discussion, etc.). However, completing specific tasks like writing content should not require any more time than it would in other projects (i.e. time and effort reflect task complexity more than the design methodology used).

Assuming that the project is not too complex or the timeline too tight, and that travel is limited, it should not significantly increase individual workloads. For example, using participatory design should not require more than a few hours (about 4 or 5) per week from each participant.

I trust that I have been able to answer your questions and assist your decision on becoming a research site for this study. Rest assured that it would be a pleasure to further discuss with you how my study can be adjusted to meet your requirements or adapt to existing constraints.

Your support for this project is very much appreciated.

Best regards,



Jean-Marc Guillemette

PhD. Candidate

Concordia University

APPENDIX C: PARTICIPATORY DESIGN FOR WORKPLACE LEARNING

Thank you for participating in this study!

This document introduces a study on the use of participatory design as an alternative to more common instructional design methods, for workplace learning. The study is carried out in partial fulfillment of the requirements for a Ph.D. in Educational Technology at Concordia University, in Montreal, Quebec.

The document also reviews your involvement in the study and what should happen over the coming months. It's intended as background information in preparation for an initial meeting during which we can review the project together and openly discuss what may be involved.

What is the purpose of this study?

The purpose of this study is to explore how participatory design can be used as an alternative to Instructional Systems Design (ISD) for workplace learning. It requires completing a project using participatory design to create a learning solution that addresses a clearly defined learning problem. It will help better

understand potential differences between participatory design and other more traditional ISD methods, explore the use of participatory design for workplace learning, investigate potential benefits and pitfalls, study relevant group dynamics and evaluate results.

What is Participatory Design?

Participatory design is essentially a collaborative approach emphasizing the continuous involvement of users and stakeholders in a design process. A fundamental principle of participatory design is that design is more effective when users directly contribute to all parts of a design process. Design efforts also benefit from the synergy achieved through increased participation and collaboration.

While more traditional instructional design models, like ADDIE[3], require following a series of formally defined steps, participatory design is more flexible and adaptable to situations and circumstances. It relies heavily on the input of all those involved to determine what should be done and how best to do it. This does

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[3] ADDIE is the acronym for the steps of a well established instructional design methodology: Analysis, Design, Development, Implementation and Evaluation.

not mean that existing ISD tools or techniques can't be used, but rather that the input of the design team is *at least as important* as models or other tools.

Who then should be part of the design team?

Simply stated, those who are most concerned with intended outcomes; in other words, with a stake in the project. Since this project is about designing an instructional techniques course for the Canadian Coast Guard College, the design team could include instructors who may take or teach the course, a member of the management team, content specialists or other stakeholders. What is most important is assembling a team of individuals interested in the project and willing to contribute.

Will individual participation be evaluated?

No, participation will not be evaluated. Participation will be monitored and notes taken to help me complete the study. Data gathered during the project will therefore be used to support the research process, not to evaluate your participation. All data will be considered strictly confidential and treated as indicated in the participant consent form.

How will the project evolve?

We can generally identify four phases for this project, illustrated here:

Figure 1: Project Phases

Phase 1: Project Framing

This is essentially what we have now started: assembling a team, reviewing the purpose of the project, discussing process, and generally getting ready to start designing!

Phase 2: Design Sessions

This phase represents the heart of the project, during which team members work together to create all relevant learning activities and materials to achieve project objectives.

Phase 3: Application

This phase focuses on pilot testing what was designed, as it will be used after the project.

Phase 4: Results Analysis

This final phase will be used to review the results of Phase 3, reach conclusions about the work done and suggest improvements to the design process whenever possible.

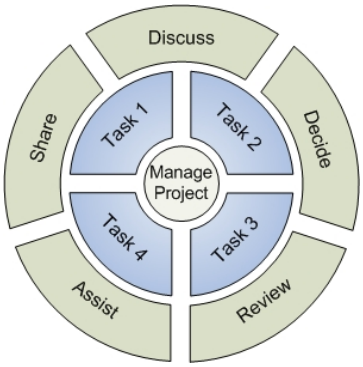

Figure 2: Levels of Engagement

As explained above, team members will be expected to actively contribute to all project phases, by (for example) attending meetings (actual or virtual), discussing issues, sharing information, helping others, participating in decision making, or reviewing process or product. This general level of participation is represented by the outer ring in Figure 2.

Team members may also be asked to complete specific tasks, based on their experience, expertise or availability. This is represented by the diagram's inner

circle. Depending on how design progresses, team members can therefore expect to alternately participate more globally or work on specific tasks. Finally, the project manager will complete all regular project management tasks.

Who is the researcher and what will be his role?

My name is Jean-Marc Guillemette and I'm passionate about workplace learning!

In preparation for this research, I have consulted a large number of documents and other sources of information on instructional design, participatory design and related topics. I have gained through this process a solid understanding of what participatory design is and how to use it, but have not yet had the opportunity to run a participatory design project. I therefore look forward to working with you and learn more about participatory design.

During the project, I will accompany the design team through all phases of the design process. I will listen to discussions, take notes, ask questions, offer guidance about using participatory design as needed and share whatever information I have that could help the team. I will not, however, manage the project or complete design tasks in the same way as other team members. From a

research perspective, this is important to ensure I don't inadvertently influence the project too much and bias results.

In closing, please don't hesitate to start a list of questions you would like to ask when we first meet. It will be a pleasure to discuss them with you.

I look forward to working with you on this project!

APPENDIX D: CONSENT FORMS

Consent Form for an Organization Participating in a Study on Participatory Design

This is to state that _____ agrees to participate in a study being conducted by Jean-Marc Guillemette, a Doctoral candidate in the Department of Education at Concordia University in Montreal, Quebec, Canada.

The academic purpose of this study is to learn about specific issues that arise when designing and developing instructional activities and materials using participatory design. The study therefore involves using a participatory design methodology to create the activities and materials needed to address specific training needs. It requires forming a team of employees representing the overall population of employees to be trained and led by an instructional designer also employed by the organization; monitoring the teams progress during the design project and providing guidance on using the participatory design methodology as needed; and, evaluating the results achieved both in terms of the effectiveness of the training that was designed and the effectiveness of participatory design in the context of workplace learning. This study is unique in that it used a methodology that is not common in instructional design and that could help improve training.

The study will also benefit practicing professionals like those in your organization by providing specific guidance on how to use participatory design to better design instruction for workplace learning.

I also understand that:

- I am free to withdraw my organization's consent and stop participating at anytime without any negative consequence.
- My participation in this study is confidential so that the researcher will know, but will not disclose this organization's identity.
- The data from this study may be published, although without any identifying information.

I have carefully studied the above statement about the research and understand this agreement. I freely consent and voluntarily agree to participate in this study.

NAME (please print)

_____

SIGNATURE

_____

TITLE (please print)

_____

If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848-7481 or by email at areid@alcor.concordia.ca.

Consent Form for an Individual Participating in a Study on Participatory Design

Dear …

Thank you for agreeing to participate in this project scheduled to take place between (date) and (date). The purpose of the project is to cooperatively design and develop training relevant to your organization and that you will be expected to complete. The project will also inform research for graduate studies in educational technology that I am currently completing. Information generated during the project, in the form of discussions, comments, work reviews, suggestions and recommendations will help understand how participatory design may contribute to the instructional design process.

Please review and confirm your understanding of the following conditions:

I understand that,

- My participation in this project is voluntary and that I can withdraw from the project at any time without negative consequences.
- My name and other information that may be used to identify me will remain confidential.

- I understand that the research report may be published in scholarly journals or other professional publications.

I agree to the following (please check one):

My name (first name only) may appear in the research report when describing or discussing my contribution. ☐

My name may not appear in the research report, but replaced instead by a pseudonym. ☐

I agree to these terms and to participate in the project, with its research component.

Researcher	Participant
Name: Jean-Marc Guillemette	Name:
Signature: _____	Signature: _____
Date : _____	Date : _____

APPENDIX E: INTERVIEW QUESTIONS

Sample Questions

- Can you tell me about yourself?
    - What is your current job role and responsibilities?
    - Can you tell me about your previous experience?

- How familiar are you with designing and developing training?
    - Can you give me some examples of work you have done in this area?

- Given what you know so far about the project, how do you expect things to go?

- Can you describe your experience in other projects that involved group or team work similar to what we intend to do?
    - What are some of the things you enjoyed from that work group?
    - What are some things you think could have worked better?

- What do you consider to be the core competencies those being trained should possess?

- Why are they important?

- How should these competencies be reflected in this training?
  - What qualities should we find in the training that will confirm we've addressed key competencies?
  - What work-related problems should this training address?
  - What should this training include to be most useful to participants when back at work?

- What will make this experience valuable for you?
  - What would you like to get out of it that will make it worthwhile?

Interview Questions during the Project

Note: these questions can be used to assess how well the project is progressing, potential changes in the motivation towards the project.

- How in your opinion is the project progressing so far?
  - What kinds of things do you like about it?
  - What should be improved?

- In your opinion, how well are we doing what we intended to do at the start of the project?
    - How closely does what we're doing match your initial expectations?
    - What are some of the more important differences between your initial expectations and what you see now?
    - How do you explain these differences? Are they good, bad?

- How do you feel about the group work?
    - Are there any differences between what you expected from the group work and what is happening?
    - What are these differences and why do you think they are happening?
    - Do you feel able to contribute to the project as you would like to?
    - Do you think the group work is helping improve the training?

- How have your views about what to include in the training changed since we've started?
    - Can you explain this change?

Interview Questions after the Project

- Please summarize your experience of this project: what was planned and achieved, what went well, what could have gone better.

- How satisfied are you with the training we've developed?
    - What do you think are the best features of the training?
    - How well do you think this training will meet the training needs identified?
    - What could we have done better?

- How satisfied are you with the group work?
    - How effective was it to design and develop this training? Can you give some examples of how group work either helped or hindered how the training was designed?
    - How useful would it be to use this type of group work to design and develop other training in your area?
    - If asked, would you participate in this type of group work again?

- What, if anything, has changed in your views about how to design learning activities?
- If your views have changed, what are the main reasons for this change?

Interview Questions Used During the Initial Interview

All interviews started with casual conversation to put interviewees at ease before asking more specific questions.

1. Can you tell me about yourself?
    - What is your current job role and responsibilities?
    - Can you tell me about your previous experience?
2. How familiar are you with designing and developing training?
    - Can you give me examples of projects involving instructional design you've completed?
    - How about projects that may have included other types of design work?
    - Are you familiar with PD?
3. Can you describe your experience working in teams (team work):
    - What were these projects (that involved team work) about?
    - How was team work completed (how things actually worked)?
    - What did you enjoy about this team work?
    - What could have worked better?
4. How do you anticipate things to go with this project:
    - With the project overall?
    - With the team work?

- With the instructional design work?
- With participatory design?
- Do you expect encountering any particular kind of problem?

5. What will make this a valuable experience for you?
    - What would you like to get out of it that will make it worthwhile?
6. Are there any questions you would like to ask me?

Questions Prepared For a Follow-up Interview

1. How are things with the project so far?
    - What has taken place recently in the project?
    - In your opinion, how has that (the events or situations described) affected the project?
    - What activities were you asked to complete during this time? Can you tell me more about how you completed them?
    - What seems to be working well so far with the project? Why?
    - What seems not to be working as well as expected with the project? Why?
    - What challenges have surfaced and how is the team dealing with them?
2. How are things with the team?
    - How are things going with the team?

- What seems to be working well?
- What types of problems have surfaced and how are they affecting the project?

Specific questions were added to each interview depending on the individual interviewed and the events to explore. For example, I prepared these two additional questions for an interview with Peter to help clarify the project context.

3. Can you tell me more about the [program] being offered at the Institute?
4. How are you working with management on this project?
    - How does management view the project?
    - Has management raised any particular concerns about it?
    - How does management feel about using an approach based on team work and participation?

APPENDIX F: COURSE OUTLINE

The Basic Training for New Instructors or BTNI is designed to prepare subject matter experts for instructional delivery in a variety of settings. Designing courses, and other advanced instructional tasks and processes have been left for other training modules. This module is strictly about knowledge and skills transfer for College Instructors and Regional Trainers alike.

During this program you will cover the "basics" of:

- **Professional Foundations** - How to communicate effectively; The importance of professional development in instruction; Instructional ethics and legal standards; and Instructor Credibility.
- **Planning and Preparation** - Planning of instructional methods and materials; and Preparing for instruction.
- **Instructional Methods and Strategies** - Stimulating learner motivation and engagement; Presentation skills; Facilitation skills; Questioning skills; Providing clarification and feedback; Retention of Knowledge and skill; Transfer of knowledge and skills; and The use of technology to enhance learning and performance.

- **Assessment and Evaluation** - Evaluation of instructional effectiveness; and Assessing learning and performance.
- **Management** - The management of an environment that fosters learning and performance; and The management of the instructional process through the appropriate use of technology.

Structure

Course Introduction

Introduction to the BTNI

Professional Foundations

Practice Effective Communications

- Explain Effective Communications
- Identify Appropriate Image
- Choose Language Appropriate to the Situation
- Describe Non-verbal Behaviors
- Acknowledge the Relationship Between Positive Non-verbal Behaviour and Personal Feelings
- Acknowledge the Importance of Active Listening Skills

Promote Professional Development

- Value Professional Development for Instructors
- Acknowledge the Need for Continued Proficiency
- Exhibit Established Ethical and Legal Standards
- Identify the Departmental Code of Values and Ethics
- Discuss Professional Ethics as applied to Supervision
- Define the Notion of Professional Ethics
- Value Intellectual Property Rules and Regulations
- Discuss the Fair and Equitable Treatment of Learners
- Identify the Ethical and Legal Implications of Instructional Practices
- Identify Requirements for Confidentiality and Anonymity
- Identify the Coast Guard Conflict of Interest Guidelines
- Maintain Professional Credibility
- Discuss Workplace Communications
- Value the Values and Opinions of Others
- Demonstrate Subject Matter Expertise

Planning and Preparation

Select Instructional Methods and Materials

- Analyze Relevant Characteristics of Learners and Other Participants

- Synthesize Instruction to Accommodate Learners, Instructional Settings and Presentation Formats
- Synthesize or Modify Resources as Required
- Identify the Proper Sequence of the Lesson's Goals and Objectives
- Synthesize Instructor Notes, Assessment Tools and Supporting Materials
- Value Quality Assurance Procedures for Instruction

Prepare for Instruction

- Discuss Dealing with Learner Difficulties
- Organize Learners for Instruction
- Identify Key Points, Relevant Examples, Anecdotes and Additional Materials
- Discuss Logistical and Instructional Settings that Support Instruction
- Discuss Importance of Making Instructional Resources Accessible to All Learners
- Set-up and Confirm Readiness of Equipment, Technology and Tools

Instructional Methods and Strategies

Create and Sustain Learner Motivation and Engagement

- Perform so as to Gain and Maintain Learner Attention

- Discuss the Need for Clear Identification of Goals and Objectives
- Value the Fostering of a Favorable Attitude Towards Learning
- Value the Relevance of Increasing Learner Motivation
- Assist Learners to Set Realistic Expectations
- Discuss the Need for Providing Opportunities for Learners to Participate and Succeed

Exhibit Effective Presentation Skills

- Adapt Presentations to the Learning Context
- Discuss the Need to Present Key Ideas in a Variety of Ways
- Discuss the Provision of Examples as a Method of Clarifying Meaning
- Discuss the Involvement of Learners in Presentations
- Adapt Presentation to Learner Needs

Exhibit Effective Facilitation Skills

- Discuss Using the Knowledge and Experience of Participants
- Discuss the Need to Give Directions That are Clearly Understood to ease the facilitation process
- Discuss the Need to Keep Facilitation Learning Activities Focused

- Discuss the Need to Encourage and Support Collaboration while Facilitating Discussion
- Discuss the Need to Bring Facilitation Learning Activities to a Closure
- Discuss Monitoring, Assessing and Adapting to the Dynamics of the Situation

Exhibit Effective Questioning Skills

- Describe Clear and Relevant Questions
- Discuss Following Up on Questions from Learners
- Discuss the use of Variety of Question Types and Levels
- Discuss the Directing and Redirecting of Questions to Promote Learning
- Discuss the Use of Questions to Generate and Guide Discussions
- Discuss Methods of Building Subsequent Learning Activities Based on Previous Questions

Develop Clarification Through Feedback

- Communicate with the Intent of Receiving and Providing Constructive Feedback
- Discuss the Provision of Opportunities for Learners to Request Clarification

- Discuss Clarification and Feedback Strategies
- Discuss the Need for Clear, Timely, Relevant and Specific Feedback
- Discuss the Need to Be Open and Fair When Giving and Receiving Feedback
- Discuss the Provision of Opportunities for Learners to Give Feedback
- Assist Learners to Give and Receive Feedback

Promote Retention of Knowledge and Skills

- Value Learning
- Discuss the Linking of Learning Activities to Prior Knowledge
- Discuss the Need to Encourage Learners to Elaborate Concepts and Ideas
- Discuss the Provision of Opportunities to Synthesize and Integrate New Knowledge
- Discuss the Provision of Opportunities to Practice Newly Acquired Skills
- Discuss the Provision of Opportunities for Reflection and Review

Promote Transfer of Knowledge and Skills

- Discuss the Need to Use Examples and Activities Relevant to Application Settings

- Demonstrate the Application of Knowledge and Skills in Realistic Settings
- Discuss the Provision of Opportunities to Practice in Realistic Settings
- Discuss the Provision of Opportunities to Plan for Future Applications
- Evaluate with Learners the Conditions that May Help or Hinder Knowledge Transfer
- Discuss the Provision of Opportunities for Autonomous Learning

Use Media and Technology to Enhance Learning and Performance

- Discuss the Capabilities and Limitations of Media and Technology for Instruction
- Apply Best Practices When Using Media and Technology
- Organize Content in a Variety of Ways
- Discuss the Preparation of Learners for the Use of Media and Technology
- Discuss the Need to Troubleshoot or Fix Minor Technical Problems

Management

- Manage an Environment That Fosters Learning and Performance
- Discuss the Need to Anticipate and Address Situations that May Impact Learning and Performance
- Discuss the need to Ensure that Learners Can Assess Resources

- Discuss the Need to Establish Ground Rules and Expectations with Learners
- Discuss the Employment of Time Management Principles During Instruction
- Discuss the Discouragement of Undesirable Behaviors in a timely and Appropriate Manner
- Discuss the Resolution of Conflicts and Problems Quickly and Fairly
- Manage the Instructional Process Through the Appropriate Use of Technology
- Discuss the Use of Technology as a Method to Seek and Share Information
- Discuss the Use of Technology to Store and Reuse Instructional Resources
- Discuss the Use of Technology to Maintain the Security and Privacy of Learner Information

Assessment and Evaluation

- Manage the Evaluation of Instructional Effectiveness
- Discuss the Evaluation of Instructional Materials
- Discuss the Evaluation of Instructional Methods and Learning Activities
- Discuss the Evaluation of Instructor Performance

- Discuss the Evaluation of the Impact of Instructional Settings and Equipment
- Describe the Documentation and Reporting of Evaluations
- Manage the Evaluation of Learning and Performance
- Discuss the Need to Communicate Assessment Criteria
- Value the Monitoring of Individual and Group Performance
- Value the Assessment of Learning Outcomes
- Discuss the Need to Provide Learners with Opportunities for Self-assessment
- Discuss the Assessment of Learner Attitudes and Reactions

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